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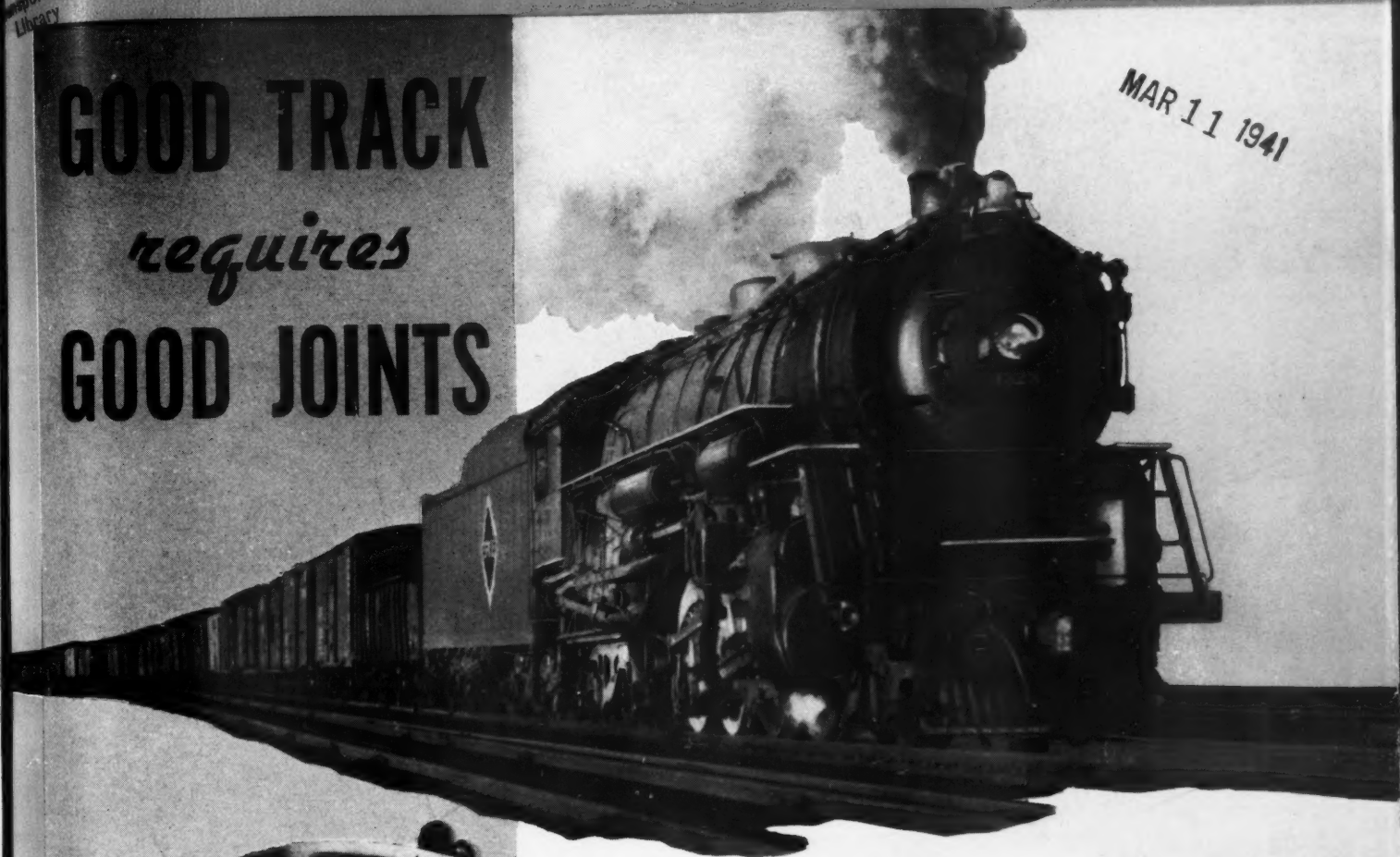
MARCH 8, 1941

Railway Age

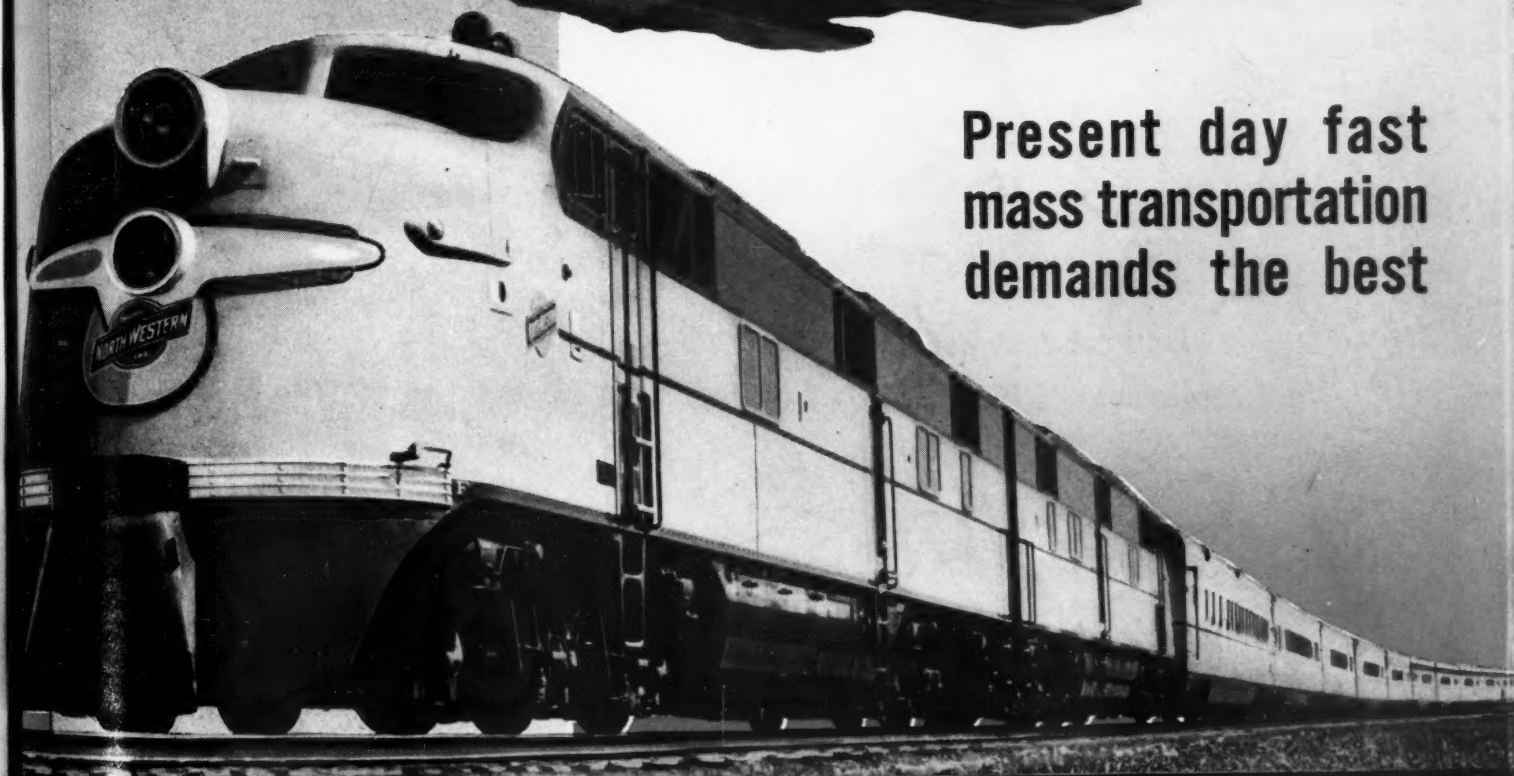
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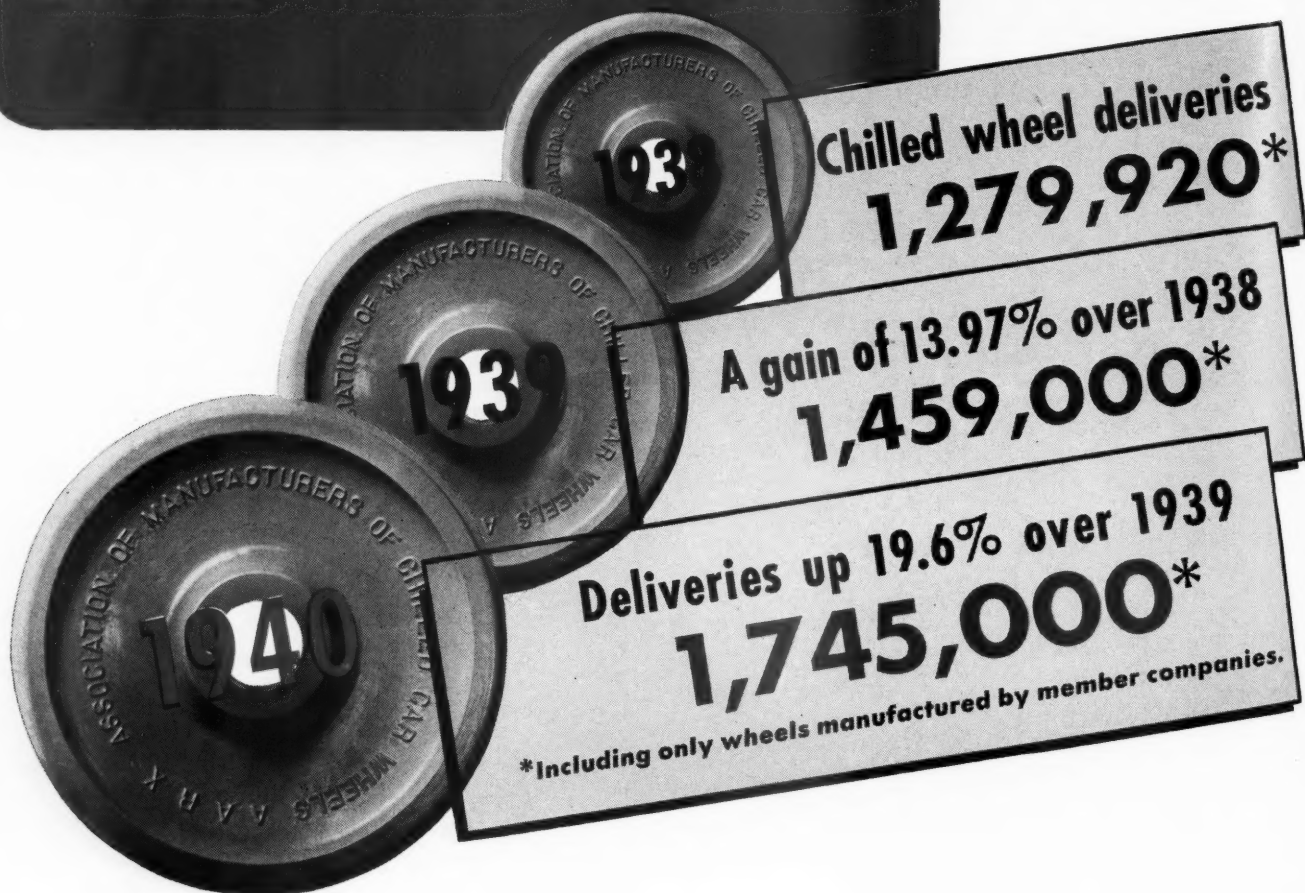


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In This Issue

Poppet Valves Prove Capacity on P. R. R. Test Plant at Altoona . . Page 405

The results of a series of tests conducted at the P. R. R.'s Altoona test plant on locomotive 5399—equipped with the Franklin system of steam distribution—are discussed in this article.

Expenditures for Construction and Maintenance Will Rise to \$830,000,000 in 1941 412

This article reviews the railroads' program of expenditures for the year, which includes increases in all important items and indicates that activities will reach the 1931 level.

Federal Grade-Crossing Program Makes Steady Headway 416

Developments during the last twelve months on this important project and the progress so far made are set forth in this article.

EDITORIAL

G. M. Harrison vs. a Free Press; Economics of Employee Welfare 401

GENERAL ARTICLES

"Heads We Win, Tails You Lose" 404
Poppet Valves Prove Capacity on P. R. R. Test Plant at Altoona 405
Expenditures for Construction and Maintenance Will Rise to \$830,000,000 in 1941 412
Federal Grade-Crossing Program Makes Steady Headway 416

NEW DEVICES 420

NEW BOOKS 429

NEWS 430

REVENUES AND EXPENSES OF RAILWAYS 446

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The Week at a Glance

EQUIPMENT ORDERS: Analysis of orders for locomotives and rolling stock in February (published in the news pages herein) reveals that the strong upturn in this market which began last summer is not letting up. Car orders, it is true, were lower in February than in January—but locomotive orders took a big leap forward.

THE DITCH IN MICH.: The eminent economist Dr. Lewis Haney, in a recent article in the Detroit Times, exposed the St. Lawrence project as a venture which has little real support except among government officials; this quite aside from its lack of any economic reasons to recommend it. This article has been reprinted and is being distributed throughout Michigan by the R. R. Co-operative League in that state, an organization in which railroad employees are the prime movers. The last time this project came near to adoption, Michigan was one of the few states where there was genuine "grass roots" interest in the proposal—for which, probably, alert railroad employees deserve the principal credit.

"SOUTHERNER" SOON: About March 25 the Southern's new Diesel-electric, streamlined coach train between New Orleans and New York will begin regular operation. An exhibition trip will probably be run with one of the trains about ten days before the inauguration of regular service. A bevy of hostesses, who will cater to added customer comfort on these trains, reported on March 3 for a course of training in their new duties.

BLOOD FROM A TURNIP: The I. C. C. recently authorized the D. & R. G. W. to abandon a narrow-gauge line between Antonito, Colo., and Santa Fe, N. M., and now Senator Johnson of Colorado has introduced a resolution calling on the Commission to report to the Senate the grounds for its action. Meantime the train service organizations have asked the I. C. C. to hold up the abandonment until a 3-judge court gets around to deciding, in the Pacific Electric case, whether Congress has "labor protection" powers in abandonment cases. Railroadings, more and more, ceases to be regarded as a business for the purpose (or with a chance) of making money; but is looked upon, rather, as a compulsory private philanthropical enterprise—which exists to provide service at less than cost, and jobs at wages in excess of the market rate.

LEA FORWARDER BILL: On March 11 House hearings will begin on H. R. 3684, the bill Congressman Lea has introduced to regulate freight forwarders; a bill which, incidentally, has the approval of the forwarders themselves—quite different from Senator Reed's forwarder bill, S. 210. Mr. Lea's bill would give the forwarders common carrier status (denied to them in the Reed bill); and it would permit them to make joint rates with other carriers. Meantime, the I. C. C. has grown weary of waiting for forwarder legislation from

Congress and has announced that March 16 is the deadline for existing joint rate arrangements between forwarders and truckers. After that date forwarders will have to pay regular tariff rates of motor carriers.

AFTER 50-FT. CARS: Car Service Chairman Kendall is after those 50-ft. box cars with unrelenting vigor. Requirements for such equipment, equipped with end doors or auto loading devices, are now "stepping up rapidly," says the Ace Car Chaser, and there are "too many instances" wherein the Division's orders with respect to such cars are being "misunderstood or overlooked."

TEXAS PULLMAN ORDER: An order of the Texas Commission, requiring Pullman conductors on all sleeping car runs in that state got to the Supreme Court this week. That body, though, refused to rule on the measure (thus reversing a federal district court which voided the Commission's action). Instead, the high court sent the case back to Texas to be tried in state courts.

ENGINEERING DEPT. PROSPECTS: The current year promises to see 530 million dollars spent for maintenance of way and structures—approximately the same as in 1931 and larger than any annual program since that year. For construction, the outlook is for an outlay of 300 millions, which would top the 1931 figure. These prospective expenditures are analyzed in an article elsewhere in these pages.

GRADE CROSSINGS: The status of the federal government's grade crossing elimination program is reviewed in an article herein. At the end of January about 2,800 crossings had been done away with, 567 had been reconstructed and almost 3,000 had been given some protection. A considerable number of additional projects were under way or approved.

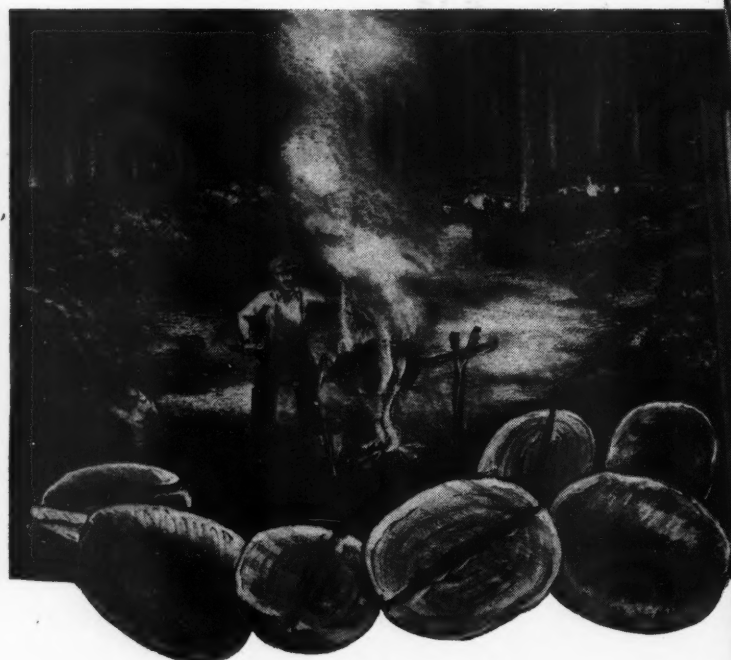
STEEL CAPACITY: It has so often been incumbent upon us, in our sincere and considered belief that the system of free enterprise holds out the only hope for maximum well-being of the American people, to question the acts and statements of President Roosevelt, tending to promote socialism and stateism, that it is a genuine pleasure to be able to record an act by him which is favorable to free enterprise. We refer to the controversy over steel capacity. For months the Socialists and other radicals, many of them in government employ, have been clamoring for larger steel capacity and even that the government go into the steel business itself—a set-up designed to promote post-war socialization of the steel industry. The president assigned an eminent engineer to examine objectively all the evidence, and has accepted and made public his report as to the adequacy of existing plant capacity greatly to the chagrin of the left-wingers.

THE THREAT TO LABOR: In George Harrison's memorable castigation of the Wall Street Journal (reported in our news pages last week) he indicated his belief that the railroads are now handling much more traffic than they were 20 years ago. If the railroads were getting along as well as Mr. Harrison thinks they are, maybe he would have a valid argument for his vacation project. Unfortunately, as the leading editorial herein demonstrates, they are not. The railroads are losing ground constantly in competition; and to hold their own (and protect their employees' jobs) they need new capital and lower costs. To the extent that the unions value employment of railway labor, they should recognize this hard reality and cooperate with management to meet it.

BAD NEWS FOR US ALL: Of definite and alarming significance to every person connected with the railway industry is the implication of the Defense Advisory Committee's 1942 traffic estimate, reported in the news pages herein. That estimate is that the country's total traffic in 1942 will be the largest in history, but that railroad business will be only three-fourths as great as it was in 1929. In other words, in a period of 13 years the railroads will have lost one-fourth of their total traffic to competitors—and, of course, the loss is continuing. To stop this loss, and thus protect the jobs of their employees, the railroads need to apply every dollar they can get hold of to reducing their costs or improving their service, thus strengthening their competitive position. Is there any step more imperatively in the interest of employees than this? How many employees know the facts of this situation? Whose duty is it to inform them?

POPPET VALVES ON THE PRR: The performance of "O. C." poppet valves, in road tests on the Pennsylvania, was described in last week's issue. This week we are relating the showing on the test plant at Altoona made by the locomotive equipped with these valves. At high speed (85 m. p. h.) the locomotive showed approximately 21 per cent less steam consumption per horsepower per hour than the standard power of its class.

CONFUSION IN VT.: Bewildered, apparently, by a mass of economic and fiscal data beyond its powers of analysis, Vermont's joint transportation commission has quietly fizzled out—without any tangible accomplishment toward surmounting that state's acute and perplexing transportation problem. The commission admitted its inability to arrive at an opinion on the matter of truck subsidy—which was the principal job it was named to perform. It refused to recommend that trucks be made liable to personal property taxes, as railroads are, in the belief that such action might decrease rather than increase state revenues. To say that the Green Mountain has labored and brought forth a mouse, would probably be an overstatement.



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G. M. Harrison vs. a Free Press; Economics of Employee Welfare

It will be a matter of deep concern to patriotic railway employees that a man who has been honored with spokesmanship for so many of them should have taken it upon himself to call the fundamental American and democratic principle of freedom of the press into question. We refer to the attack made by George M. Harrison upon the Wall Street Journal (as reported in our last week's issue); and his declaration that "before long the citizenry of this nation is going to rise up and *very properly* demand that the right of free press be limited" (our italics). The censoring of the press, to require it to interpret the news according to some authoritarian opinion is, of course, totalitarianism pure and simple. Democracy cannot survive without a free press and a dictatorship would find it hard to survive with it.

Mr. Harrison's Publicity Advantage

Mr. Harrison has a perfect right to disagree with the interpretation put upon the news by the Wall Street Journal or any other publication. Not only do most reputable newspapers extend the courtesy of their columns to persons who disagree with them (as the Wall Street Journal did to Mr. Harrison); but, in Mr. Harrison's case, his own organization has a magazine in which he can and does give currency to his interpretation of economic developments. In addition, the paper "Labor" would doubtless oblige by giving Mr. Harrison all the space he requires to expound his views. The Wall Street Journal has a circulation of approximately 28,000. Figures on the circulation of "Labor" and "Railway Clerk" are not given in the standard reference book of such information—but combined, the two papers must reach at least 10 times as many persons as does the Wall Street Journal. Mr. Harrison, moreover, is in such favor at the White House that he was able to use its unequalled publicity power as a sounding board when he launched his demand for paid vacations. It seems to be inordinately intolerant that a man who enjoys Mr. Harrison's extraordinary machinery for attracting public attention should begrudge much more modest facilities to those whose interpretation of the news does not coincide with his own.

The report in the Wall Street Journal which aroused Mr. Harrison's resentment was one dealing with present and prospective demands by union labor on the rail-

roads for more favorable wages and working conditions. The Journal staff weighed all these proposals and published its estimate that they might total 190 million dollars a year. The demand of the 14 non-operating unions for paid vacations was included in the Journal's aggregate figure, and Mr. Harrison took the view that the paper had deliberately sought to leave the impression that the vacation demand alone would cost this aggregate sum of money. By contrast, Mr. Harrison maintains that paid vacations will cost the railroads not more than 27 million dollars.

Motives for Accuracy and Inaccuracy

We shall not attempt a critical analysis of either of these estimates—but it should be noted that the Wall Street Journal is primarily an investors' paper—which depends for its living upon its success in giving persons with funds to invest the information they need to make their investments safely and profitably. For such a newspaper deliberately either to understate or to overstate the probable cost of union demands on the railroads would be an act of destruction against the stock in trade on which it depends for a livelihood. That such a publication might make mistakes is quite possible. That it should deliberately publish false information, of a character to mislead investors, is a charge which is simply preposterous. Quite aside from the Journal's high professional reputation, it has a plain motive of self-interest impelling it to accuracy in reporting such a matter.

Mr. Harrison, however, did not content himself with accusing others of publishing misleading information on the railway wage and earnings situation—he also spread some misinformation of his own. For instance, he said:

"... today about half the number of employees that were on the railroad payrolls 20 years ago are handling a far greater volume of traffic . . ."

Actually, the railroads in 1940 moved 370 billion ton-miles of revenue freight, as against 410 billion revenue ton-miles in 1920—a decline of almost 11 per cent. Revenue passenger-miles in 1940 were almost exactly 50 per cent less than they were in 1920. This state-

How Labor Profits Most When "Capital" Also Is Paid a "Living Wage"

	A	B	C	D	E	F	G	H	I	J	K
	Total Wages Paid to Labor (Millions)	Total Earnings of "Capital" (Net Railway Operating Income) (Millions)	Per Cent of What "Capital" Got to What Labor Got	Average Yearly Wages Per Employee	Average Yearly "Wage" of \$10,000 of R. R. "Capital"	Per Cent of Wage of \$10,000 of "Capital" to the Wage of the Average Employee	Gross Capital Expendi- tures for Additions and Better- ments (Millions)	Freight Expense Per 1,000 Ton- Miles	Percent- age of R. R. Freight Traffic to Potential Traffic	Total Railroad Operat- ing Revenues (Millions)	Per Cent of Total Revenues Paid in Wages
1921	\$2,765	\$601	22	\$1,666	\$281	17	....	\$10.78	..	5,517	50
1922	2,641	760	29	1,623	352	22	....	9.50	..	5,559	47
1923	3,004	962	32	1,617	428	26	\$1,059	8.88	..	6,290	48
1924	2,826	974	34	1,613	420	26	875	8.53	..	5,921	48
1925	2,861	1,121	39	1,640	471	29	748	8.07	..	6,123	47
1926	2,946	1,213	41	1,656	496	30	885	7.79	..	6,383	46
1927	2,910	1,068	37	1,677	428	26	772	7.84	..	6,136	47
1928	2,827	1,173	41	1,706	461	27	677	7.52	100	6,112	46
1929	2,896	1,252	43	1,744	481	28	854	7.44	99	6,280	46
1930	2,551	869	34	1,714	328	19	873	7.43	99	5,281	48
1931	2,095	526	25	1,664	199	12	362	7.45	96	4,188	50
1932	1,513	326	22	1,466	124	8	167	7.24	93	3,127	48
1933	1,404	474	34	1,445	182	13	104	6.48	87	3,095	45
1934	1,519	463	31	1,508	178	12	213	6.57	89	3,272	46
1935	1,644	500	30	1,653	193	12	188	6.63	87	3,452	48
1936	1,849	667	36	1,735	257	15	299	6.40	87	4,053	46
1937	1,985	590	30	1,781	227	13	510	6.41	86	4,166	48
1938	1,746	373	21	1,859	143	8	227	6.78	85	3,565	49
1939	1,864	589	32	1,886	226	12	262	6.39	82	3,995	47
1940	1,950	682	35	1,900	261	14	400	...	..	4,297	45

ment of Mr. Harrison's is most revelatory. While making an accusation of misinformation against another, he certainly would not voluntarily have left himself open to a similar accusation. The only conclusion possible is that he does not *know* how much traffic the railroads have lost. Being in ignorance of this all-important fact, it is small wonder that he is out after higher wages and better working conditions for his clientele.

He also speaks with the greatest optimism about the "profits" the railroads made in 1939 and in 1940, and those which are in prospect for 1941. Here again, either deliberately or because he does not know any better, Mr. Harrison gives a misleading impression. Railroads, taken as a whole, do not earn "profits"—all they earn is interest, or, more strictly speaking, a "return on investment." What Mr. Harrison calls the railroads' "profit" in 1940 was actually an interest rate of 2.61 per cent on invested capital. Does Mr. Harrison or anybody else consider, when he invests his savings, that 2.61 per cent is an exorbitant rate of interest (especially when, in some years, the rate earned may be as low as 1¼ per cent)?

Information Needed for Employee Protection

When a man occupying the important position of leadership that Mr. Harrison does, serving as spokesman for 14 railway labor organizations, manifests such a lack of knowledge of the fundamental facts as to railway traffic, earnings and wages, is it any wonder that thousands of his followers are even more deeply in the dark? And how can people possibly make decisions intelligently *even in their own interest*—while they labor under the apprehension that railroad traffic in 1940 was greater than it was in 1920; and while they believe that the railroads are now earning fancy "profits." Let us confess right here that, if the actual facts of the railroad situation at all resembled Mr. Harrison's statement, then he would have a rather

plausible argument for his vacation demand. Unfortunately, for railroad employees no less than for railroad owners though, the actuality does not at all resemble Mr. Harrison's rosy picture of it.

In the following analysis we omit all consideration of justice to railroad investors or to railway patrons, and approach the problem solely as a question of the welfare of railroad employees. Union leaders usually show small concern over the number of men employed—concentrating their major attention upon increasing the wages and improving the working conditions of men actually employed. They usually disregard how many men have to be laid off in order to maximize the incomes of those who work. This point of view is scarcely that of railroad employees, though—except maybe a few old heads who feel safe in their jobs no matter what lay-offs occur. The average man who works for a living first wants security of his job. It is time enough to talk about more pay when the job is safe. So, in our analysis we have assumed that the first goal of employees seeking to protect their own interests will be *high total wages paid to all railway labor*. Only when that figure is good and big is it possible to have high wages *per employee* without sacrificing the number of jobs.

Column A in the accompanying table shows the total sums paid in wages to railway labor for each of the past 20 years. It will quickly be noted that 1923, 1926, 1927, and 1929 were the four best years from the standpoint of the greatest total prosperity for railway employees. Similarly, 1932, 1933, 1934 and 1935 are seen to have been the lowest employee-income years. The next step is to determine what *other* factors of the railroad situation were associated with maximum payments to employees—under the assumption, if these other factors can be determined, that reproducing them will also reproduce maximum employee earnings. Negatively, the factors associated with the lowest total payments to employees may also be observed, with the

purpose of avoiding those factors if possible—thereby also avoiding low income for employees.

In other words, in what other columns in the table do large figures correspond with large figures in column A? And in what other columns do low figures appear in the same years which have low figures in column A? A brief examination of the table will disclose that there is a close association between high figures in column A and similarly high figures in columns B, C, E, F, and J; and some correspondence, but not so close, between high figures in column G and column A. On the other hand, there appears to be little or no correlation between figures in column A and those in columns D, H, I and K.

Reasonable "Wages" for Capital Aid Labor

Thus, high total earnings of railway employees are seen to be closely associated with high total earnings of "capital;" with a high ratio of earnings by capital to those of labor; with a high annual "wage" to capital; and with large gross railway revenues. Conversely, in the years when earnings of capital have been low, absolutely and relatively—and when gross railway revenues have been low—total earnings of labor have also been at their lowest.

The striking dependency of total railway wages on gross railway revenues is revealed in column K. This is the most important fact there is in all the economics of the welfare of railway employees—and yet how many employees either know it or appreciate its significance? Not in 20 years has the total sum paid out to employees been greater than 50 per cent of gross railway revenues, nor less than 45 per cent thereof. *Gross railway income is the determinant of the economic condition of railway employees taken as a whole.* Of almost equal significance, is the revelation in this table that high wages per employee do not cause a large income for railway labor as a whole. For example, the average employee in 1940 received \$1,900 in wages, which was \$287 more than the average employee received in 1923; but total wage payments in 1923 were over a billion dollars greater than they were in 1940.

Mr. Harrison thinks that the railroads are handling more traffic now than they did 20 years ago, and consequently, he is quite optimistic—as he would have a right to be if his facts were straight. But the truth is much more somber. The railroads are today faced with competition of a kind which seriously threatens the future, not only of their owners, but of their employees as well. There is one principal means of meeting that competition, and that means is portrayed in column H, namely, reducing the unit cost of railroad service. In the nine years from 1921 to 1930, as the table shows, the railroads succeeded in taking \$3.35 off of the cost of producing 1,000 revenue ton-miles (a reduction of 31 per cent). In the nine years from 1930 to 1939, they were able to effect a reduction of only \$1.04, or 14 per cent, in this cost.

The reasons for the decline in the rate of improve-

ment are: First—from 1921 to 1930 the average wage per employee went up only \$48, while from 1930 to 1939 the increase was \$172, or four times as much; Second—in the nine years ended 1930, the railroads spent on the average each year 700 million dollars on capital improvements, while in the nine years ended 1939, their annual expenditures for improvements averaged only 260 million dollars—a decline of 63 per cent. It takes capital improvements to bring operating costs down—and capital has to be paid a higher "wage" than the railroads have been paying it in recent years in order to provide thoroughly modern railroads to meet today's competition.

Higher total railway wages, as the table shows (column K), can come only from an increase in total railway operating revenues (column J). Such an increase in revenues requires an increase in traffic which, in turn, if it is to give assurance of continued railway employment, requires an end to the diversion of railway tonnage to other methods of transportation (the alarming extent of which is revealed in column I). Suppose this diversion in traffic had not occurred. Then in 1939 the railroads would have had 18 per cent more freight traffic than they actually had. If it may be assumed that this 18 per cent additional traffic would have been accompanied by a similar increase in gross revenues, then in 1939 the railroads would have taken in 720 million dollars more than they actually did take in, and 338 million dollars of that increase would have gone to labor (as column K shows) in the form of increased wage payments. Even if the amounts to be regained by the railroads and their employees are only a half or even only a third of these sums, are they not still big enough to be worth making some immediate sacrifices to attain—especially since the alternative is to continue losing the revenues and the wages which the railways *now* maintain?

New Capital Needed to Meet Competition

To stop the diversion of traffic, the unit costs of railway transportation (column H) must be reduced. In order to reduce these costs, first, expenditures for additions and betterments (column G) should be increased, while, second, wages must at least not advance so rapidly that they keep railroad unit costs at a level which permits the continued diversion of traffic to other forms of transportation. Similarly, more adequate capital expenditures cannot be made (to reduce railroad costs and thus permit the carriers to hold on to traffic and continue maximum total wage payments) unless the wages of capital are restored to a more attractive figure. The average railroad employee drew 9 per cent *more* wages in 1940 than in 1929, whereas the average dollar of invested capital drew 46 per cent *less*. *Experience is showing that the wage being paid to capital is not high enough to attract the capital needed to keep the railroads sufficiently modern to enable them to hold their own against competition.* What kind of future does this situation hold for railroad em-

ployees? How many of them know these facts? Whose job is it to tell them?

These, and other similar data which could be adduced, all point to one inevitable conclusion to anybody who will take the trouble to analyze them. That conclusion is that it is in the long-run interest of railway employees (if they want to be working five or ten years hence) to moderate their demands for higher wage rates or costly improvements in working conditions until the railroads have restored their ability to command new capital and until a consequently modernized and low-cost railroad service puts an end to losses of traffic to competitors.

Mr. Harrison, along with the other members of the

Association of Railway Labor Executives, some time ago made known their adherence to the "Moral Rearmament" movement. Among the tenets of that program is dedication to honesty and unselfishness. Mr. Harrison will be his own best judge as to how fully, in his attack on the Wall Street Journal, he has lived up to the program to which he subscribed. Be that as it may, those qualities, if generally applied, would certainly go a long way toward curing the world (including the transportation industry in America) of the troubles which beset it. If to those great virtues were added an intelligent curiosity for facts (forswearing prejudices and hunches), quite likely most of our social problems would melt away.

"Heads We Win, Tails You Lose"

It appears to be the predominant sentiment among motor carriers, after taking full advantage of the neglect of the railroads to modernize their rate structure—but now being confronted with the threat of such revision—that they should modestly indicate their willingness to continue their greatly over-expanded condition and to retain all the advantages they enjoy, provided they are permitted to continue to—

(1) Give complete door-to-door service on less-truckload traffic at rail rates,

(2) Give complete door-to-door service, including free loading and unloading, on carload traffic at rail rates,

(3) Contravene the intent of the law which requires them to give the public the benefit of the "inherent advantages" of highway transportation; and which leading motor carrier spokesmen pledged to Congress they would preserve to the public,

(4) Retain these competitive advantages over the railroads arbitrarily, by affording a more complete service, as a rule, than the railroads do, but at rail rates.

And why shouldn't motor carriers be satisfied to do this? The latest reports show their principal traffic continues to increase at a much greater rate than that of the railroads.

As a typical illustration of the failure of the present motor carrier rates to conform to the requirements of the law, the Central Territory Motor Freight Bureau implicitly admitted in its 82nd petition in Ex Parte MC 21 that some of its present rates do not conform to the law. It seems plain from a study of motor carrier deliberations that predominant opinion among them is leading them to seek, (1) to retain their present rates which do not conform to the law, (2) to create a situation even less in conformance with the law, and (3) to block and delay indefinitely lawful action by their competitors.

Even if many of the truckers' proposed rates are suspended on petition by alert shippers, many of them will probably become effective by the default of not-so-alert shippers—unless the Interstate Commerce Commission exercises its power to protect the public interest by suspending all of them on its own motion. Even if this smoke-screen serves only the purpose of creating such an agitation that the Commission is persuaded to suspend the railroads' rate proposals, it will have succeeded

—because it will have protected, for a considerable period, the many existing rates which admittedly do not conform to the law.

To draw attention away from truck rates which do not conform to the law, the motor carriers are also employing propaganda, charging that the railroads are either trying to destroy them outright, or to impoverish them to the extent that the railroads may take them over and operate them as a part of an integrated transportation system. Thus they are trying to cultivate public sympathy by taking on the character of the under-dog being endangered.

No rate alterations are being contemplated by the railroads which will impoverish efficiently operated motor carriers and prevent them from operating in their *sound economic radius*. Those carriers which operate beyond their economic radius are not entitled to protection under the law in such uneconomical operations. The rate revisions that have been tentatively agreed to by the railroads conform closely to the recommendations made by the Federal Co-ordinator to Congress. They are responsive to the suggestions made by the Commission in general proceedings now pending; to the admonitions of the Commission in all general increased rate cases since 1930; and they conform to the rate-making rules in the Transportation Act of 1940. In fact, the railroads could properly under the law go much further with their suggested revision, by taking some of the inflation out of their short-haul rate structure.

There have also been reports to indicate that some motor carriers are employing pressure methods to discourage shipper representatives from speaking their firm convictions in protest; and have suggested retaliatory measures against those who oppose them.

The national interest, as well as the law, require that this situation be dealt with in accordance with recognized principles of sound competition; and that the public be not denied the advantages of the most economic transportation. There is nothing in the law or in common sense which justifies the continuance of an arbitrary umbrella over truck rates, which is so high that even the most inefficient can operate profitably by the simple expedient of picking and choosing.

Poppet Valves Prove Capacity on P. R. R. Test Plant at Altoona

Franklin system of steam distribution develops over 4000 i. hp. at 100 m. p. h. with steam rate one-third less than piston-valve locomotive

IN an extensive series of tests on the Pennsylvania Railroad test plant at Altoona, Pa., locomotive No. 5399, a Pennsylvania class K4s Pacific type equipped with the Franklin system of steam distribution, with O. C. poppet valves,* and a new single-pass Type ASW superheater, developed a maximum indicated horsepower of 4,267 at about 75 miles an hour and an indicated horsepower of 4,099 at 100 miles an hour. Compared with the indicated horsepower of a standard class K4s locomotive, at a steam consumption of 70,000 lb. per hour, No. 5399 showed an increase in indicated horsepower capacity of 16.2 per cent at 40 miles an hour, 17.1 per cent at 60 miles an hour, 22.9 per cent at 80 miles an hour, and 46.8 per cent at 100 miles an hour. Translated into terms of steam economy, locomotive No. 5399 used 13.8 per cent less steam per indicated horsepower-hour at 40 miles an hour, 14.5 per cent less at 60 miles an hour, 18.4 per cent less at 80 miles an hour, and 31.7 per cent less at 100 miles an hour. While this improvement is largely due to the poppet valves, it should be

* A description of the changes in this locomotive to fit it with the Franklin system of steam distribution and an account of the road tests and road service on the Pennsylvania Railroad appeared in the *Railway Age* for March 1, 1941, page 375.

stated that, in addition to the improved superheater, the No. 5399 was equipped with a larger dry pipe, front-end throttle, and larger steam pipes and exhaust passages, all of which contributed to the better performance. The highest net evaporation of locomotive No. 5399 was at 100 miles an hour, the highest speed tested, and amounted to over 77,000 lb. of water an hour.

The Test Program

Before the program of plant tests was started locomotive No. 5399 was taken into the shop for a new superheater. There was no change in the tube sheet

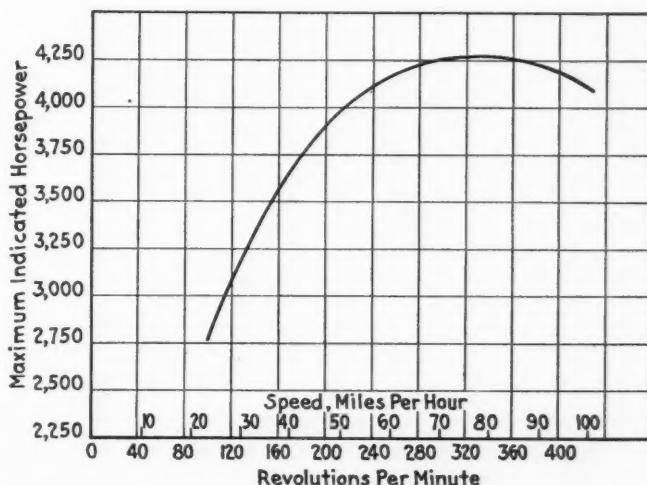
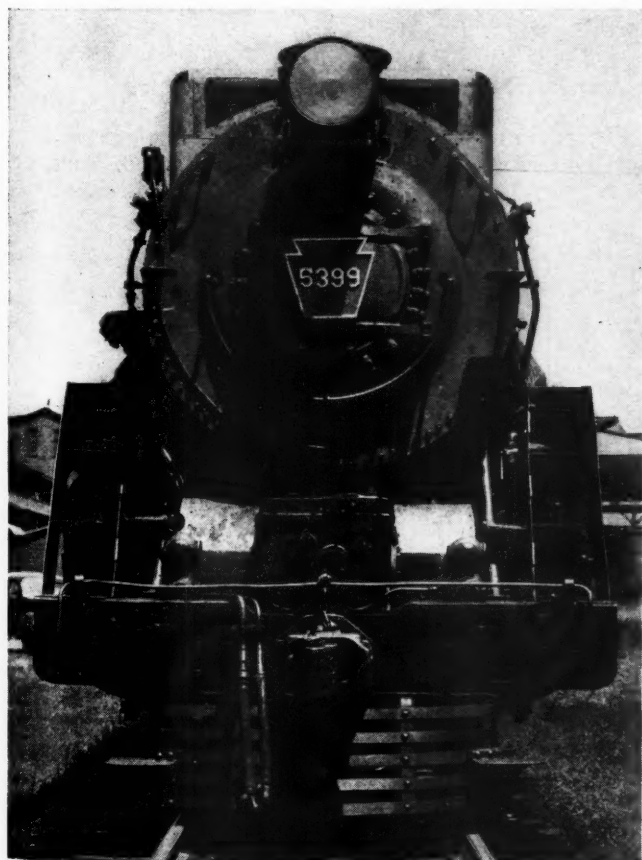
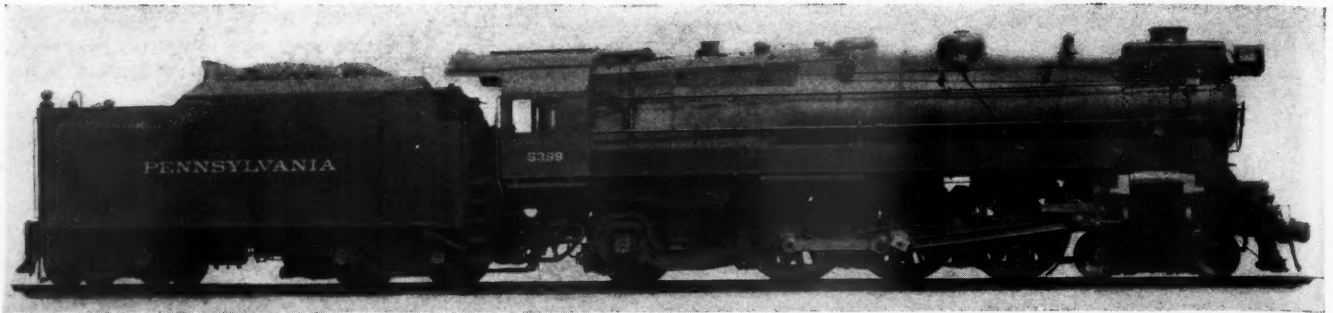


Fig. 1—The Maximum Indicated Horsepower Developed by Locomotive No. 5399



or number of flues, but the original Type A superheater was removed and replaced with a new larger header, including the multiple throttle, and with single-pass Type ASW units, the pipes of which are sine waved. Each unit consists of two loops in parallel, thus increasing the cross-sectional area of the steam passage through the units. Table I presents a comparison of the principal dimensions of the locomotive as it was tested on the road and as it was tested at Altoona. It will be seen that the area of steam passages has been increased so that the minimum restriction between the boiler and branch pipes has been increased from 45.5 sq. in., the area through the original superheater units, to 70.9 sq. in., the area through the new dry pipe, and that the minimum area between the superheater header and each cylinder has been increased from 28.27 sq. in., the area through one superheater-header outlet, to 48.56 sq. in., the area through two intake valves. There is also an increase of approximately 6 per cent in superheater heating surface due to the lengthening of the units and the use of sine-waved unit pipes.



Pennsylvania Railroad Locomotive No. 5399 After the Installation of a New Superheater Header with the Multiple Throttle and Type ASW Single-Pass Superheater Units

The total engine weight of the standard K4s Pacific type locomotive is 320,000 lb. In Table I it will be seen that at the time of the road tests following the installation of the Franklin steam distribution system the weight was 330,800 lb. Following the installation of the new superheater and header the weight was 340,580 lb.

The test-plant program included a total of 56 test runs. These were divided in three series, each with a different size exhaust nozzle. The main series of 38 tests was

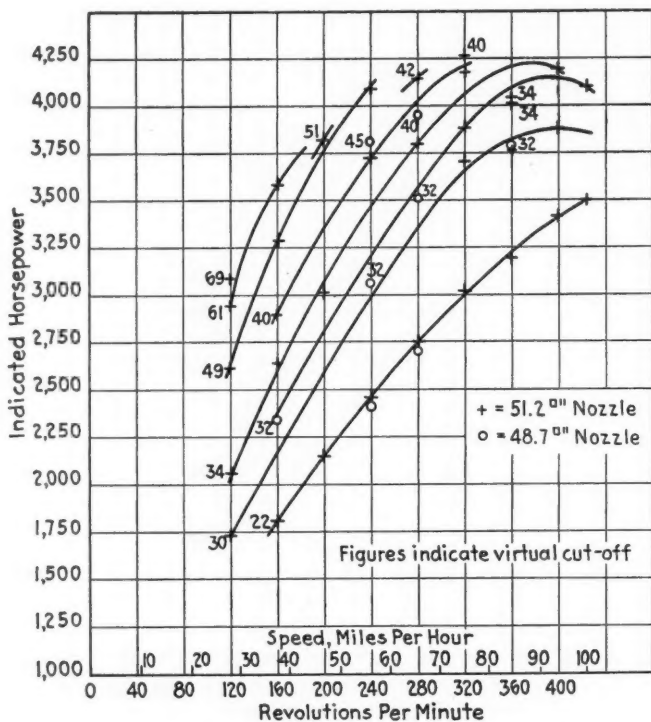


Fig. 2—The Relationship of Indicated Horsepower to Speed for Various Cut-Offs of Locomotive No. 5399

run with a nozzle having a discharge area of 51.2 sq. in.; 15 tests were run with a 48.7-sq. in. nozzle, and three tests with a 45.7-sq. in. nozzle.

The best performance was obtained with a nozzle area of 51.2 sq. in., but the results with the 48.7-sq. in. nozzle were only slightly less favorable than those obtained with the larger nozzle and they are plotted on the graphs.

The observations included all factors affecting boiler capacity and efficiency, cylinder performance, and machine efficiency. In this article for the most part considerations will be confined to those factors directly affecting evaporation and superheater performance, and cylinder and machine performance, all of which are affected by the steam-distribution system and the change

Table I—Dimensions and Weights of Pennsylvania Locomotive No. 5399

	At time of road test	At time of test-plant tests
Tractive force, lb.	44,460	44,460
Weight on drivers, lb.	208,800	216,930
Total weight, lb.	330,800	340,580
Driving wheels, diameter, in.	80	80
Cylinders, diameter and stroke, in.	27 x 28	27 x 28
Boiler pressure, lb.	205	205
Grate area, sq. ft.	68.7	68.7
Steam flow area, sq. in.:		
Max., through throttle	54.6	...
Through dry pipe	56.7	70.9
Through superheater subheaders ....	...	80.0
Through superheater units	45.5	...
Through double superheater units ....	...	91.0
Through multiple throttle ....	...	85.5
Through one header outlet	28.27	50.2
Through one steam pipe	50.2	50.2
Through two intake valves	48.56	48.56
Through steam port	54.0	54.0
Through two exhaust valves	68.0	68.0
Min., through one exhaust passage	68.0	68.0
Heating surfaces (fire side), sq. ft.:		
Firebox	311	311
Tubes and flues	3,375	3,375
Total evaporative	3,686	3,686
Superheater	1,205	1,277
Comb. evap. and superheater	4,891	4,963

in the superheater. The conditions under which the locomotive was tested in the main test series are set forth completely in Table II.

Cylinder Power and Steam Rates

The principal results of the tests are presented in a series of graphs. Fig. 1 shows the maximum indicated horsepower characteristics of locomotive No. 5399. It

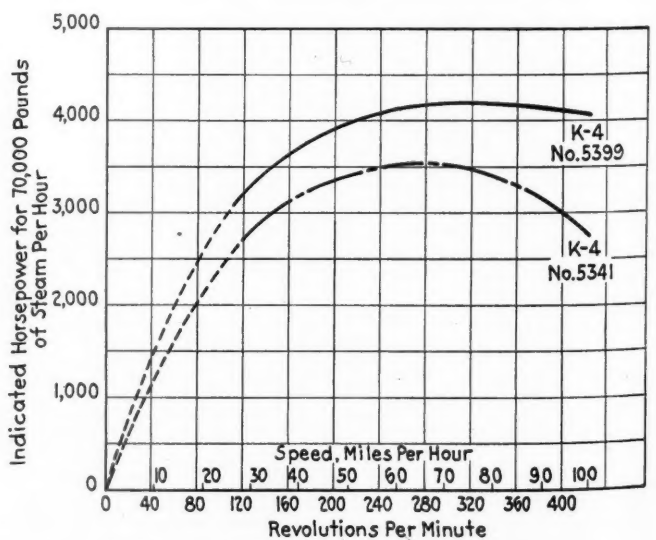


Fig. 3—Comparison of the Indicated Horsepower Output of Locomotives Nos. 5399 and 5341 for a Uniform Cylinder Consumption of 70,000 Lb. of Steam per Hour

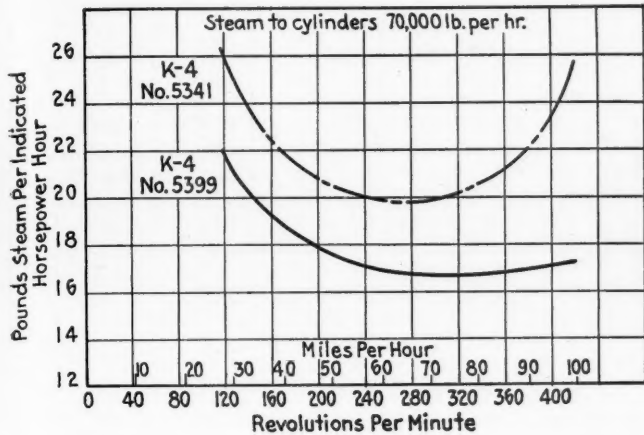


Fig. 4—Water Rates of Locomotives Nos. 5399 and 5341 for a Uniform Cylinder Consumption of 70,000 Lb. of Steam per Hour

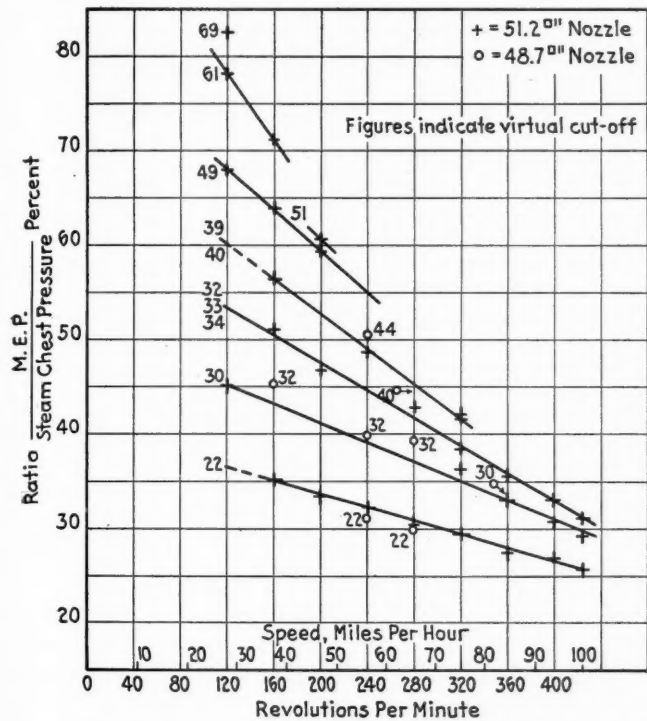


Fig. 5—How the ratio of Mean Effective Pressure to Steam-Chest Pressure Varied with Speed for Each Cut-Off at Which the Locomotive Was Operated

Table II—Program of Tests of Locomotive No. 5399 Conducted at the Altoona, Pa., Test Plant

Nominal cut-off per cent	Revolutions per minute								
	120	160	200	240	280	320	360	400	423
15	8†	22	22	22	22	22	22	22	22
20	30	..	..	..	..	30**	30	30**	30
25	..	..	..	..	..	32	..	..	..
30	..	..	..	..	..	39**	..	..	..
35	34	34	34	40	42	..	34**	..	33
40	..	40	..	..	..	..	..	..	..
45	49	49	49	..	..	..	..	..	..
50	..	..	..	49	..	..	..	..	..
52½	..	..	51	..	..	..	..	..	..
55	61	61	..	..	..	..	..	..	..
68	69	..	..	..	..	..	..	..	..

* Virtual cut-offs are taken at 2-deg. camshaft swing before valve closure, corresponding to approximately 1/64-in. valve opening.

† Obtained from indicator-card marking.

** Tests repeated.

is worthy of note that the curve is relatively flat over a considerable range of speed and that at 100 miles an hour the locomotive is still capable of developing more than 4,000 i. hp.

In Fig. 2 the indicated horsepower-speed relationships of the tests at the various cut-offs are shown and uniform cut-off lines have been laid in. These lines indicate the conditions at which the maximum indicated horsepower was attained at the various speeds.

Fig. 3 is a graphical comparison of the indicated horsepower performance of locomotive No. 5399 with that of another K4s locomotive, No. 5341, which was tested at Altoona in 1937. These curves are plotted for a uniform cylinder steam consumption of 70,000 lb. per hour and, therefore, present an indication of relative economy as well as of indicated horsepower capacity. They show an increase in indicated horsepower in favor of locomotive No. 5399 of 16.2 per cent at 40 miles an hour, 17.1 per cent at 60 miles an hour, 22.9 per cent at 80 miles an hour, and 46.8 per cent at 100 miles an hour.

The economy aspect of the poppet-valve system of steam distribution is more clearly shown in Fig. 4 which compares the pounds of steam per indicated horsepower-

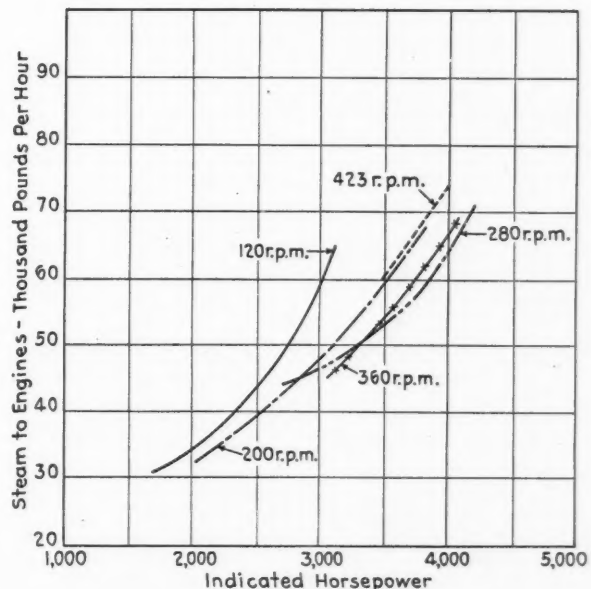
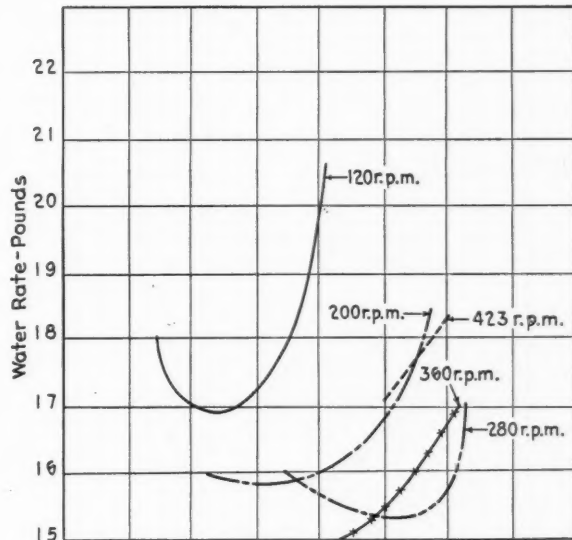


Fig. 6—Water Rate and Total Steam-Consumption Curves for Each of Five Selected Speeds

hour at the 70,000-lb.-per-hour consumption rate for the two locomotives. The best economy of No. 5399 at this rate of steam consumption is 16.7 lb. per i. hp.-hr. at 75 miles an hour. In the case of locomotive No. 5341 the best steam rate at this rate of consumption is 19.8 lb. per i. hp.-hr. and was attained at about 65 miles an hour. At 85 miles an hour No. 5399 developed an indicated horsepower for 16.8 lb. of steam per hour, while the consumption for 5341 is 21.2 lb. per hour, and for higher speeds the difference increases rapidly.

The consistency of cylinder performance with changes in speed and cut-off is shown clearly in Fig. 5. Here the ratio of mean effective pressure to steam-chest pressure in per cent is plotted against the speed of the locomotive. The variations of the individual test values from the uniform cut-off lines are slight and a regular straight-line decline in the ratio of mean effective pressure to cylinder pressure is indicated as the speed increases. Like Fig. 2, this chart also indicates that the maximum mean effective pressure and indicated horsepower at the highest speed were attained with a cut-off of about 33 per cent. Shorter cut-offs will not develop the full capacity of this locomotive at speeds up to 100 miles an hour.

The trend of the relationship between total steam consumption and horsepower and the water rate and

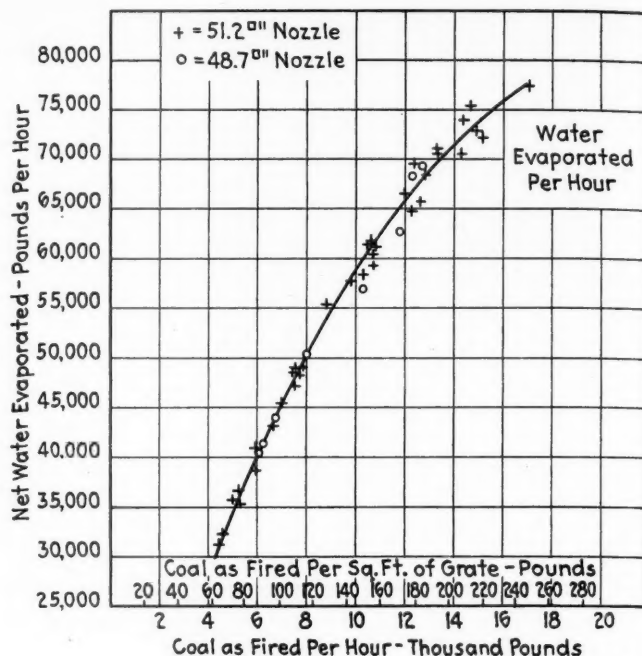


Fig. 9—The Relation of Net Water Evaporated to the Coal Fired for Locomotive No. 5399

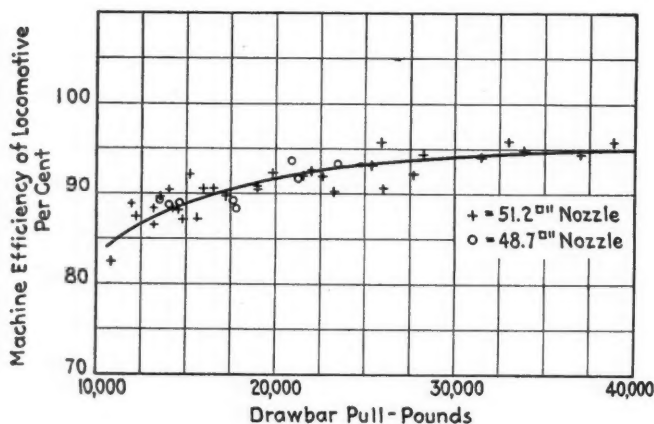


Fig. 7—The Relation of Machine Efficiency to Drawbar Pull of Locomotive No. 5399

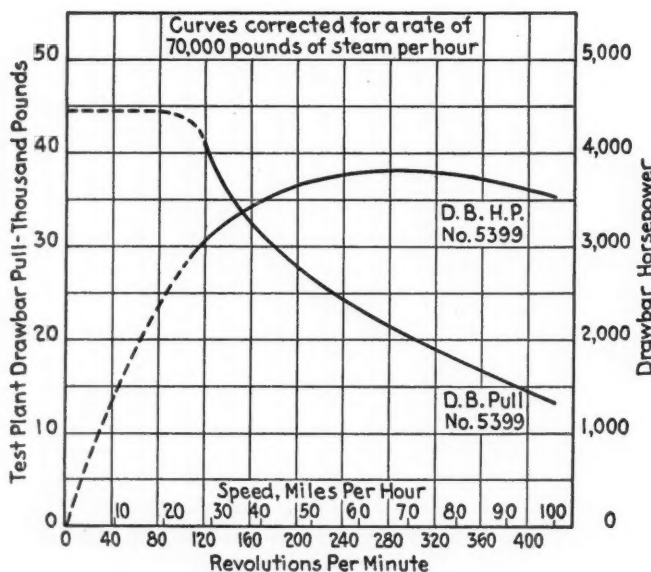


Fig. 8—The Maximum Drawbar-Pull and Drawbar-Horsepower Characteristics of Locomotive No. 5399

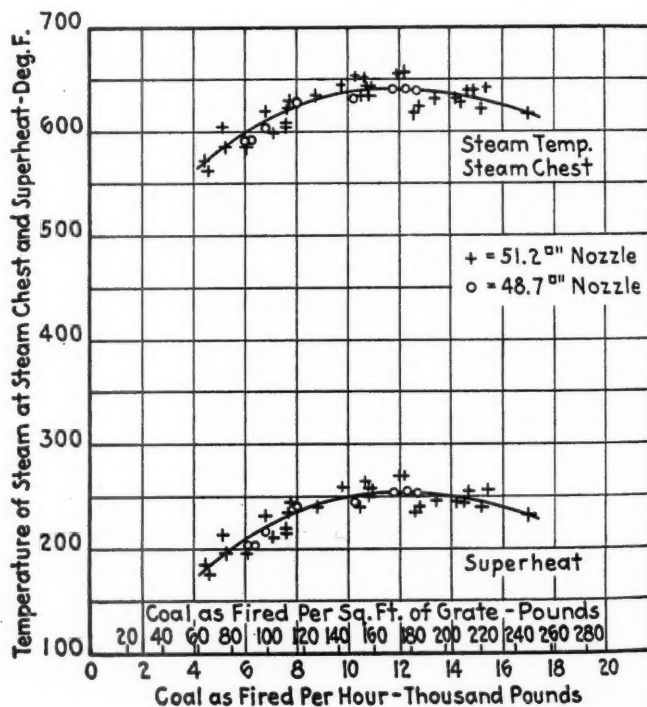


Fig. 10—Steam-Chest Steam Temperature and Superheat in Relation to the Pounds of Coal Fired-Locomotive No. 5399

Table III—Horsepowers Required to Drive the Franklin Steam Distribution System

(Data from Tests in the Manufacturer's Laboratory)

R.p.m.	Horsepower
210	0.05
250	0.06
300	0.41
350	1.05
400	1.40
450	1.73
500	3.3

horsepower for various locomotive speeds are shown in Fig. 6. Tests were run at intervals of 40 r.p.m. Because of the relatively small spread of the values, however, clearness required the omission of curves for alternate values. Those plotted show speeds 80 r. p. m. apart, beginning with 120 r. p. m. It will be seen that for a given total steam consumption the horsepower increases with the speed up to 280 r. p. m. and then decreases for 360 r. p. m. and the maximum speed of 423 r. p. m. In the case of the water rate the minimum consumption decreases and occurs at progressively higher indicated horsepowers for speeds up to 280 r. p. m. Above these speeds a given water rate is obtained at progressively lower horsepower outputs.

These curves, like Fig. 4, show that the range of best economy comes within the working range of speeds and horsepowers.

Drawbar Power and Machine Efficiency

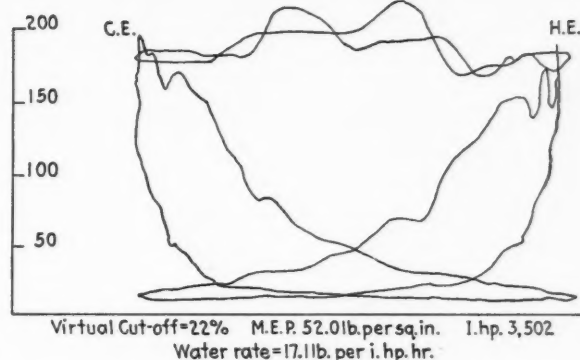
The machine efficiency of the locomotive plotted against drawbar pull is shown in Fig. 7. From a value of 85 per cent at about 11,000 lb., the efficiency rises to a maximum of about 95 per cent at 40,000 lb. The median values shown by the curve have been applied to the indicated horsepower curve for 70,000 lb. of steam per hour to produce the values shown on Fig. 8, the drawbar horsepower curve.

One factor bearing upon the relatively high machine efficiency of locomotive No. 5399 is the small horsepower required to drive the valves and valve gear. No data

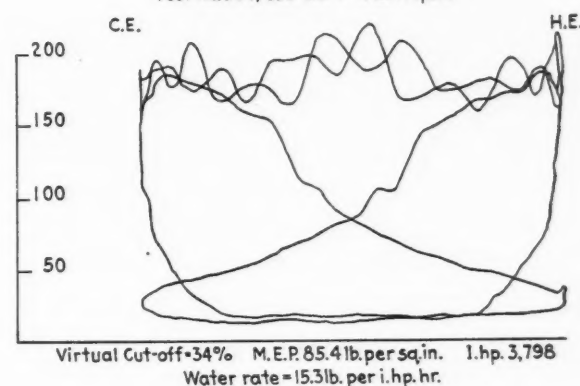
Table IV—Data from Selected Tests of Pennsylvania Locomotive No. 5399 with Franklin Steam Distribution System and Type ASW Single-Pass Superheater

Test number	(51.2 Sq. In. Exhaust Nozzles)			
	926	903	927	938
Selected because of	Max. i. hp.	Max. db. hp.	Max. speed; max. boiler output	Max. economy
Virtual cut-off, per cent....	39	49	33	22
Designation—r.p.m., cut-off, throttle	320-30-F.	240-50-F.	423-30-F.	360-15-F.
Duration, hrs.	0.2	0.5	0.5	0.5
Speed, m.p.h.	75.8	56.8	100.0	85.2
Temperature, deg. F., steam in steam pipes to locomotive cylinders	632	639	617	608
Boiler pressure, lb.	205	204	203	205
Pressure drop between boiler and steam chest (total), lb. per sq. in.	10.5	9.6	10.8	7.7
Superheat, deg. F., steam in steam pipes to locomotive cylinders	246	254	233	221
Superheat, deg. F., exhaust steam from locomotive cylinders in exhaust passages	45	52	54	8
Net water evaporated, lb. per hr.	70,585	75,250	77,480	48,716
Equiv. evaporation, lb. per hr.	94,985	101,244	103,790	64,945
Equiv. evaporation, lb. per hr. per sq. ft. heat. surface	19.1	20.4	20.9	13.1
Superheated steam, lb. per hr.	69,430	73,934	76,208	47,776
Mean effective pressure, lb. per sq. in.	84	107.9	61	56
Indicated horsepower, total..	4,267	4,114	4,099	3,191
Water rate, steam per i. hp.-hr., lb.	16.3	17.97	18.6	15.0
Drawbar horsepower, total..	3,862	3,934	3,547	2,790
Drawbar pull, lb.	19,110	25,961	13,301	12,282
Water rate, steam per db. hp.-hr., lb.	18.3	19.1	21.8	17.5
Tractive force based on mean effective pressure, lb.	21,122	27,152	15,373	14,048
Locomotive friction, hp.	405	180	552	401
Locomotive friction, pull at drawbar, lb.	2,004	1,188	2,070	1,765
Machine efficiency, per cent	90.5	95.6	86.5	87.4
Steam per i. hp.-hr., lb. (calculated from heat drop in cylinders)	17.1	17.1	18.6	15.7
Difference between steam per i. hp.-hr. from heat drop and from indicator cards as a percentage of water rate, steam per i. hp.-hr.	+4.9	-4.8	0.0	+4.7
I. hp. calculated from heat drop in locomotive cylinders	4,060	4,324	4,099	3,043

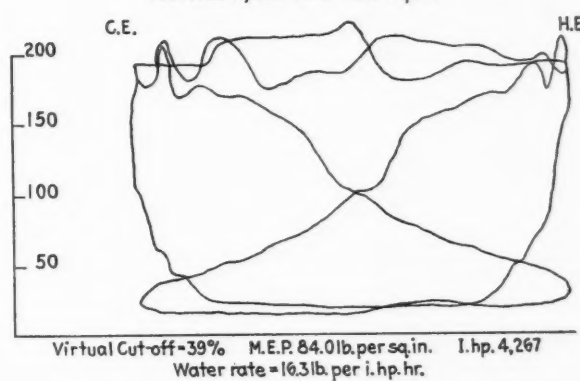
Test No.941, 423-15-F-100.1 m.p.h.



Test No.904, 280-30-F-66.3 m.p.h.



Test No.926, 320-30-F-75.6 m.p.h.



Test No.914, 120-45-F-28.4 m.p.h.

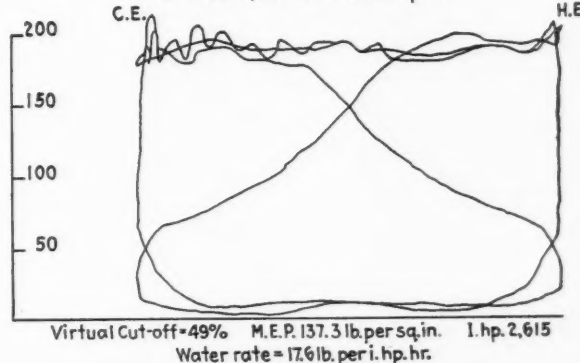


Fig. 11—Selected Indicator Cards Taken from the Right Cylinder of Locomotive No. 5399 at Various Cut-Offs and Speeds

segregating the power required for this purpose are available from the test-plant tests of the locomotive, but tests were made showing the power required to drive the gear box, cam box, and valves in the steam chests in the laboratory of the manufacturer. These values at various speeds are shown in Table III. While the character of the drive between the gear box and the crosshead of the locomotive differs from that employed at the test plant, the figures indicate that an extremely small percentage of the friction horsepower of the locomotive is required to actuate the valves.

Boiler Performance

The performance of the boiler is shown in two charts. Fig. 9 shows the net water evaporated in pounds per hour in relation to coal consumption. It shows a maximum capacity of over 77,000 lb. with no indication of a marked change in the trend of the water-coal relationship at the higher boiler outputs. In Fig. 10 are shown the temperature of the steam at the steam chest and the degrees of superheat plotted against coal. In a number of individual tests within a range of coal consumption between 10,000 and 13,000 lb. per hour, steam temperatures slightly above 650 deg. were developed. These values range between a net water evaporation of about 58,000 lb. and 67,000 lb. per hour.

Selected Test Runs

The principal data from four tests are shown in Table IV. These are the tests in which maximum indicated horsepower, maximum drawbar horsepower, maximum

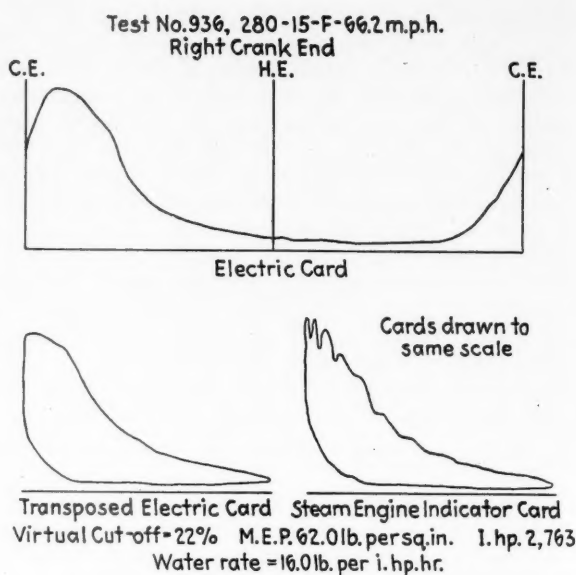
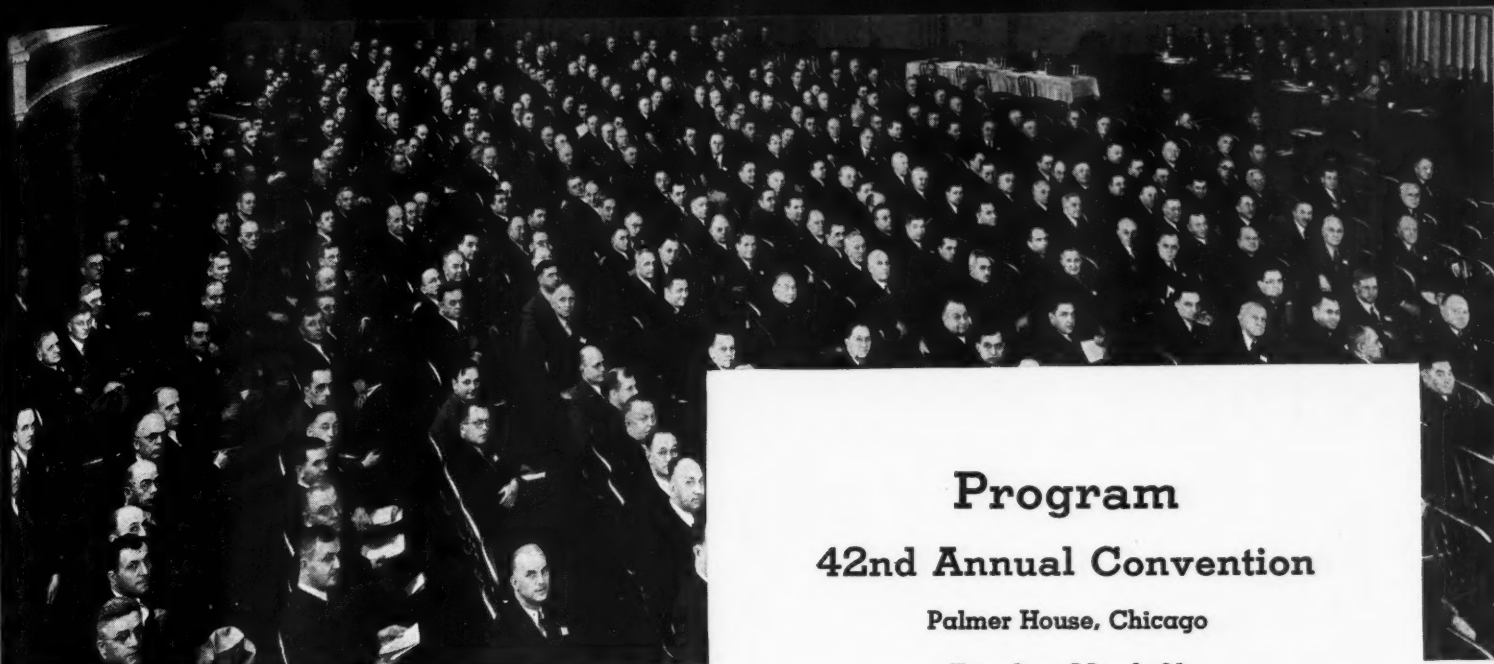


Fig. 12—How the Electric Indicator Card Compares with the Cards Taken from the Steam-Engine Indicator

speed and boiler output, and maximum economy were attained. The maximum indicated horsepower was obtained at a speed of 75.8 miles an hour with a virtual cut-off of 39 per cent and a mean effective pressure of 84 lb. per sq. in. The indicated horsepower was 4,267 which was developed with a consumption of steam at
(Continued on page 428)



Locomotive No. 5399 in the Pennsylvania Railroad Test Plant at Altoona



A. R. E. A. Convention Section

Containing
The Convention Program
N. R. A. A. Exhibit Hours

**Expenditures for Construction and Maintenance Will
Rise to \$830,000,000 in 1941**

**Federal Grade-Crossing Program Makes Steady
Headway**

**Descriptions of New and Improved Products of
Manufacturers**

A complete report of the convention, including abstracts of the reports and addresses presented at the various sessions and of the comments made in discussion from the floor, will appear in the next, or March 15, A. R. E. A. Convention Proceedings Issue of the *Railway Age*.

National Railway Appliances Association Exhibit International Amphitheatre

Monday, March 10—9:00 a.m. to 6:30 p.m.
Tuesday, March 11—9:00 a.m. to 10:00 p.m.
Wednesday, March 12—9:00 a.m. to 6:30 p.m.
Thursday, March 13—9:00 a.m. to 3:00 p.m.



Program 42nd Annual Convention

Palmer House, Chicago

Tuesday, March 11

Morning Session—9:45 A. M.

Convention called to order
Address by F. L. C. Bond, acting president
Reports of the Secretary and the Treasurer
Memorial Tribute to President George Stokes Fanning, by E. M. Hastings
Address by C. H. Buford, vice-president, Operations and Maintenance department, A.A.R.
Reports of committees on
Standardization
Signals and Interlocking
Electricity
Economics of Railway Location and Operation

Afternoon Session—2 P. M.

Reports of committees on
Waterways and Harbors
Highways
Cooperative Relations with Universities
Uniform General Contract Forms
Water Service, Fire Protection and Sanitation
Adjournment at 4 p.m. for visit to the exhibit of the National Railway Appliances Association at the International Amphitheatre

Wednesday, March 12

Morning Session—9 A. M.

Reports of committees on
Economics of Railway Labor
Maintenance of Way Work Equipment
Wood Preservation
Roadway and Ballast
Track

Association Luncheon, 12 o'clock

Address by Hon. Clarence F. Lea of California, Chairman of the Committee on Interstate and Foreign Commerce of the National House of Representatives

Afternoon Session—2:30 P. M.

Reports of committees on
Ties
Stresses in Railroad Track
Rail
Report by Prof. H. F. Moore on the joint investigations being made of continuous welded rail and fissures in rails
Paper by W. B. Leaf, research technician, D. & R. G. W., on photo-elastic studies of stresses in rail joint bars.

Thursday, March 13

Morning Session—9 A. M.

Reports of committees on
Buildings
Yards and Terminals
Records and Accounts
Rules and Organization
Iron and Steel Structures
Impact

Afternoon Session—2 P. M.

Reports of committees on
Masonry
Wood Bridges and Trestles
Waterproofing of Railway Structures
Closing Business

Expenditures for Construction and Maintenance Will Rise to \$830,000,000 in 1941



Grading Operations on the 30-Mile Line Change of the Southern Pacific Around Shasta Dam Reservoir in Northern California

Programs for year include increases in all important items and indicate that activities will reach level of 1931

IN no year since 1929 has the outlook for increased earnings been so favorable as it is this year, and in none of the 12 years that have followed the catastrophic year of 1929 have the railways looked forward with so much optimism or planned their maintenance and construction programs with such confidence. As a result of this favorable outlook, maintenance activity in 1941 will be at its highest level since 1931, and the maintenance budgets that are prepared today anticipate substantially the same expenditures as were made in that year, a record that has not been equalled in any year since 1931. There will be a corresponding increase in construction activities, for the programs now outlined contain more and larger items than for almost a decade, in addition to which still more new work is in prospect in the event that earnings continue at their present level.

Included in this forecast is the fact that the roads have included more work equipment in their budgets for 1941 than for any previous year, not excepting the lush years from 1925 to 1929, or than they purchased in 1940, the year in which an all-time record was made for the number of units of work equipment purchased. Obviously, provisions for buying so large an amount of work equipment, particularly following the year of largest purchases, indicates clearly that maintenance officers are planning to increase their maintenance activities over those of 1940.

Still more direct evidence of this increased activity is to be found in the fact that both the construction and

the maintenance budgets of the railways as a whole are being increased, and that on individual roads the increases in maintenance range up to 15 per cent, compared with 1940, which was the year of largest expenditures for maintenance since 1931, while in numerous instances construction expenditures will be several times as great as in any recent year. Authority for the foregoing statements is found in information given us by 40 representative roads in the United States with 138,000 miles of lines. Sixteen of these officers said definitely that their maintenance programs will be larger in 1941 than they were in 1940, and reported increases that ranged in magnitude from \$54,000 to \$3,000,000.

Offsetting these increases, 15 roads reported that while, in general, their plans do not contemplate larger expenditures than were made in 1940, they expect to spend as much as they did in that year. Several in this group indicated that, while they do not expect to increase their total expenditures above those of 1940, they expect to lay more rail, to apply more ties or ballast, to surface more track, to do more drainage and bank-widening work or to do more rail-end welding; others in this group will spend more money for bridge maintenance or replacements, for building repair and modernization programs, for painting bridges and buildings; while almost every road reporting said that more money will be spent on signals. Six of the roads from which information was received have not yet completed their

budgets, but three of these expect that their expenditures will be increased, especially for track items, bridges and signals.

Several of the roads that have prepared their budgets on the basis of the expenditures in 1940, advised that if earnings increase it is probable that they will spend substantially more than is planned at the moment. Taken as a whole and making due allowance for the decreases indicated by the three roads mentioned, the total for the 34 roads that have completed their budgets indicates aggregate expenditures for maintenance of \$530,000,000, which will be equal to those of 1931, and which have not been equalled since that year. This total will also be \$33,000,000 larger than the expenditures of 1940.

Basis for Optimism

With characteristic caution, most of the officers who assisted in this study said that their budgets were predicated on a continuation of the present level for earnings; that any increase is likely to result in more liberal spending, while an unfavorable turn in earnings will necessitate some retrenchment. That earnings are more likely to increase than to be less during the next two years was confirmed by Ralph Budd, president of the Chicago, Burlington & Quincy and a member of the Advisory Commission to the Council of National Defense, in charge of transportation, who said in an address two weeks ago that careful estimates of traffic indicate that, as compared with 1940, there will be an increase of 9.4 per cent in cars loaded in 1940 and of 16.9 per cent in 1942. Since gross revenues are in direct relation to carloadings, it is manifest that more funds will be available for both maintenance and construction this year than have been for a decade.

Rail will constitute a major item in the maintenance programs of all but two of the roads that have completed their budgets for the year. The programs given us also include larger sums for applying ballast, for strengthening the shoulder of the roadbed, for ditching, for sub-surface drainage, for roadbed stabilization, for surfacing track, for destroying weeds, for building up rail ends, for maintaining, strengthening and replacing bridges, for the maintenance and modernization of buildings, for the improvement of water facilities, for the rearrangement and replacement of signals to conform to the requirements of the signal-inspection law or to provide the proper braking distance for high-speed trains, and for numerous other items that make up the requirements for roadway maintenance. In other words, while rail constitutes a major item in almost every budget, these budgets also include sufficient other work in all categories so that they are not out of balance.

While some of the roads expect to lay a considerably larger mileage of rail than they did in 1940, this will be offset by decreases on other roads, so that the total mileage of new rail will approximate that of 1940. However, a number of roads indicated that they expect to increase materially the mileage of

rail relaid, while others are planning large programs for laying heavier rail in yards. A number of roads indicated that the mileage of released rail to be laid in secondary lines will be greater than the mileage of new rail, and will be well above that for 1940.

More Track To Be Surfaced

While the amount of track to be surfaced in connection with new rail is approximately the same as in 1940,



Higher Speeds and Heavier Traffic Will Call for Increased Track Maintenance in the Year Ahead

there will be an increase of about 20 per cent in the amount of relaid rail to be surfaced, exclusive of that to be laid in yards. In addition, about half of the roads reporting indicated that they expect to do a considerable amount of surfacing on track where rail is not to be laid. With only a few exceptions, the budgets call for more ballast than was used last year, these increases ranging from 10 to 100 per cent. In volume this extends from 30,000 to 300,000 cu. yd., with a total indicated increase of about 1,000,000 cu. yd. over the amount applied in 1940. That an increase is also contemplated in the amount of track to be surfaced, is confirmed by the fact that 700 tie-tamping outfits, large and small, and several power jacks, power tampers and ballast-cleaning machines are included in the 1941 budgets of all roads for work equipment.

Ballasting and track surfacing call for a stable roadbed if full benefit is to be obtained from the expenditures necessary to do the work. For this reason, no maintenance officer today would even consider the application of ballast or the general surfacing of a stretch of track unless the roadbed is of ample width to support the ballast section and is properly drained. It is to be expected, therefore, that, in connection with the rail-laying projects and the independent track-

The railways will increase their expenditures for both construction and maintenance of way and structures in 1941. In construction, the increase in the number and magnitude of the projects that have already been authorized or are in prospect, will bring the aggregate expenditure to \$300,000,000, compared with \$250,000,000 (estimated) in 1940, and with \$288,807,000 in 1931. In maintenance, the increase over 1940 will approximate \$33,000,000, bringing the total for the year to \$530,000,000 or the same as that for 1931, a figure that has not been equalled since that year. This will include appreciable increases in all of the items that enter into the maintenance of roadway and structures, with special emphasis on ballasting and on bridges. Details of these expanded programs for 1941 are presented in this article, which is based on information given us by ranking maintenance officers of 40 roads.

surfacing programs, there will be a corresponding amount of roadbed widening, cleaning of cuts, ditching and other forms of drainage. This assumption is sustained by the statements of many of the officers who advise that they are intending to place considerable emphasis on these items during the year, and by the fact that a material amount of equipment for carrying out the work is included in the budgets for the year.

Tie Renewals to Increase

Tie renewals for the railways as a whole have been consistently below the current mortality rate for more than a decade. It is to be expected, therefore, that with the enlarged rail and surfacing programs, tie renewals will be increased. This is borne out in large part by the inclusion of more ties in the budgets than were inserted last year. In general, however, the deferred tie renewals are found most largely in yards, sidings, industrial tracks, tracks that have been little used of late and tracks that have been taken out of service until business improves. As one officer put it, "our ties are only slightly below normal in all tracks that are in actual service, and our tie allowance for the year will permit us to get these tracks back to normal by the end of the year." In several cases it was stated that the plans for the year contemplate the rehabilitation of unused tracks in the expectation that increased business will require their use.

While the deficiency in rail is even greater than in ties, it is the reverse of ties, for the deficiency in rail is relatively greater in main tracks than in yards and sidings, even after the need for heavier rail in yards is given due weight. It is not intended to imply that this deficiency has been allowed to reach the point where safety has been seriously impaired; yet it is recognized universally that as rail grows older it requires far more attention than new rail. Reflecting this situation, many of the budgets include increased amounts for building up rail ends by welding, which will, in turn, require the application of new, reformed or built-up joint bars, or joint shims, so that there will be a corresponding demand for these incidental items.

In the last three or four years a new factor has been introduced into rail renewals which is exerting considerable influence in the formulation of rail programs. This is the extension of high-speed schedules for both passenger and freight trains. In not a few instances, maintenance officers are finding it necessary to replace with heavier sections, rail that would have been allowed to run for several years under the former slower schedules. It is of interest, therefore, that a considerable mileage of the new rail that is to be applied in 1941 would have been used elsewhere or not at all if it had not been considered necessary to apply it on the high-speed lines.

More Weeds Will Be Destroyed

For several years following the debacle of 1929, the railways stopped cutting the right of way, except for such weeds as are required by law to be cut, and reduced to the minimum the removal of vegetation from the roadbed and track, particularly on branch lines. Recently, partly because of the fire hazard induced by rank uncut vegetation, and partly to restore the appearance of the right of way, there has been a noticeable revival of interest in weed destruction. This interest has now been gaining momentum for about four years and although a relatively large number of weed-destroying units were purchased in each of these years, the budgets for 1941

include more than 187 units compared with 100 such machines in the 1940 budgets and 65 in 1939. In addition to this, a number of roads reported that they are expecting to employ chemicals extensively in 1941 for the destruction of weeds.

In 1941, bridge maintenance will occupy the attention of the railways to a greater extent than during any of the last 12 years. For a decade bridge maintenance has been held down to the minimum consistent with safety, and painting has been sadly deficient according to all standards, except on a few roads. Several roads reported that impending or actual deliveries of heavier locomotives are making imperative rather ambitious programs for strengthening bridges and for the replacement of some that cannot be remodeled to take the heavier loadings. In any event, because the number of replacements during the last decade has been negligible, practically all bridges are now 12 years older than they were at the onset of the depression, making it necessary to increase maintenance expenditures for these structures as a whole.

Although, with only a few exceptions, the budgets for 1941 provide for increased expenditures for bridge maintenance and painting, none of them include extraordinary or unusual items. On the other hand, an unusually large number of bridges will be replaced, including some of considerable size and importance, in addition to certain structures that must be built or rebuilt in connection with the construction or improvement of canals and floodways. Not a few of the roads also reported that they expect to increase their expenditures for the routine maintenance of timber trestles. In preparation for this increased amount of bridge maintenance, the work-equipment budgets for the year include 360 power-operated portable tools for timber and steel bridge work, and 102 power plants for their operation.

Buildings To Be Modernized

Buildings have been neglected with respect to maintenance more generally in recent years than any other class of structures, and with few exceptions maintenance officers admit freely that there is much deferred building maintenance. Among these exceptions, several report that they have been given increased appropriations for buildings in the last four or five years. Others are making a start this year, while a few said that with the larger appropriations that have been given them this year for tracks, bridges, etc., they will complete taking up the deferred maintenance on these items and will be able to give increased attention to their buildings next year.

Most of the roads reported, however, that they expect to spend increased sums for routine building maintenance. The plans of a number also include the replacement of certain obsolete or run-down buildings that can no longer be maintained economically. Still others include the alteration and extension of buildings that are in reasonably good physical condition, but which are no longer suitable for the purposes for which they are being used.

For several years modernization has been a term that has generally been associated with the rehabilitation of passenger stations, and more recently when it has been mentioned it has brought up visions of streamlined designs. While this type of modernization is still in its infancy, a number of roads report that they expect to apply it in the rehabilitation of several passenger stations. It is of more than passing interest that plans for modernization are being extended to other classes of buildings as well, including shop buildings, engine-houses, power plants, company dwellings, section tool

houses and other roadway buildings, all of which were mentioned specifically.

Water service facilities have felt the effect of larger locomotives, higher speeds and longer engine runs, more intensively than many other facilities, and while efforts have been made for several years on most roads to keep abreast of the changing demands for water, the necessary funds have not always been available to do this fully. This year, with traffic increasing, more recognition is being accorded to the catching up on the deficiencies in water service. Larger appropriations have been allotted by numerous roads and, if the budgets are carried out in accordance with present plans, there will be a material increase in the activity in this important service.

Catching Up on Deferred Maintenance

When maintenance officers have been asked about deferred maintenance during the last few years, most of them have been reluctant to admit that there has been any on their roads, although others have admitted freely that this has been one of their problems. Still others advised that while they have been keeping their tracks and bridges in condition for the volume of traffic they were than handling, any marked increase in this volume will necessitate a corresponding increase in their expenditures for tracks and bridges. It is of special interest, therefore, that an increasing number of roads contend that they have now wiped out all deferred maintenance, except on buildings, or will do so by the end of the current year.

Construction Will Be Heavier

Since 1929, railway construction has been held to the minimum, except for a few large jobs for which commitments had already been made, and a few others of consequence, such as the electrification of the Pennsylvania, that could be justified economically and could still be financed. During the decade following the onset of the depression, there have been radical changes in methods of operation that have made a multitude of railway facilities either obsolete or inadequate. This, combined with reduced construction activity, has created a pressing need for a large program of railway construction, which is as yet unfilled.

During this period, almost all roads have carried out minor programs of construction, that is, small jobs that could be financed out of current earnings and mostly on a small scale. With a few notable exceptions, there have been no large yard projects, no important line changes, no new engine terminals or other similar work carried out. This year there is a sharp contrast in the budgets with those of former years, for, although they contain more than the usual number of small projects, they also, for the first time, contain a great number of more ambitious projects that have been missing from former budgets. These include yard improvements, engine terminals, enginehouses, longer turntables, power plants, new shop buildings, new passenger stations, improved water facilities, the replacement of fuel stations, the extension of passing sidings, line and grade revisions, and others that were listed in general terms only. There will be more important bridge construction, including both new structures and the replacement of existing bridges, carried out in 1941 than has been done during all of the last 10 years.

Other forms of construction which will be continued during the year, and which affect many roads, but which are being done at no cost to them, include line changes to permit the impounding of water behind government

dams, and the elimination of grade crossings. While the current appropriation for the elimination and protection of grade crossings is \$20,000,000, no figures are available upon which to base an estimate of the cost of the line changes around the dams and reservoirs. Another type of construction in which the railways are interested indirectly, but only a small part of which they have been called upon to do, is the large mileage of tracks, approximately 2,000 miles, which is now under construction or in prospect, in connection with the national defense program. As nearly as can be estimated from information given by the officers who have assisted in this study, since some of them did not give the cost of their construction projects, the aggregate cost of all construction projects that are included in the budgets will approximate \$300,000,000, not including grade separations, line revisions around dams or tracks to serve cantonments, munitions plants, etc.

This is larger by \$50,000,000 than the expenditures for construction in 1940; it is \$12,000,000 greater than in 1931, and has not been equalled in any year since 1930.

Signal Programs Also Increased

The railways will also increase their signaling programs in 1941 to meet the requirements of high-speed schedules, to reduce unnecessary train delays and to reduce operating expenses, as well as to conform to the requirements of the new signal-inspection law. While a considerable mileage of automatic block signals is in prospect, many of the projects have not yet been authorized, although there is little doubt that they will. Those projects that have been authorized and are in prospect total well over \$3,000,000, to which must be added a number of installations of centralized traffic control, several of which have been authorized. The largest amount to be spent on signals, so far as can be foretold from the budgets, however, will be in connection with the rearrangement and replacement of signals to conform to the requirements of the signal inspection law. In addition, it is expected that there will be two and possibly three installations of car retarders in connection with the rearrangement of yards. Several interlockings will also be rebuilt during the year, and a considerable number of grade crossings will be protected by automatically-controlled crossing signals and floodlights.

One feature of the maintenance programs that continues to be outstanding is the large amount of work equipment that is being purchased year by year. Despite the large purchases that were made from 1936 to 1939, the record-breaking number of 5,414 units of work equipment were purchased in 1940. That there has been as yet no approach to the point of saturation in power machines and tools is indicated quite plainly by the fact that the budgets for 1941 call for an aggregate of 5,700 units, which will make this another record-breaking year in both the number of units purchased and the expenditures, \$7,700,000, to acquire them.

In making this survey in previous years, maintenance officers were asked whether the attitude of their roads was more optimistic or less so, with respect to resuming more normal maintenance and improvement programs. This year the evidence of optimism were so widespread that this question was considered superfluous, and this was borne out by the contents of the budgets as well as by the tenor of the replies to the questionnaire that was the basis for this study. On the whole, the spirit of hesitation which was apparent in many of the replies in previous years was not in evidence, but was replaced by a spirit of confidence in the future of maintenance and construction that has not been shown for many years.



Above—A Works Program Structure Carrying the Atchison, Topeka & Santa Fe Over U. S. Route 66 at Joliet, Ill. *

Below—This Through-Truss Overpass Carries a Highway Over a Single-Track Line of the Northern Pacific in Bonner County, Idaho



Federal Grade-Crossing Program Makes Steady Headway

Developments during year include reduction in allotments for 1942 and 1943, progress in perfection of hazard formula and effects of the national-defense program

STEADY progress characterized federal grade-crossing elimination and protection activities during the last 12 months, the work being carried forward at about the same pace that prevailed during the previous 12-month period. The more recent period also produced a number of developments that are destined to have a profound effect, directly or indirectly, on the future course of the program. To mention the more important of them, these developments included a substantial reduction in the authorizations voted by Congress for grade-crossing elimination work for the years 1942 and 1943, further progress in the development of a formula for determining the relative hazard ratings of the grade crossings in a given group, and the necessity of adapting the grade-crossing program to the requirements of national defense.

Before proceeding to a detailed discussion of these developments and of the progress made in the grade-crossing program during the last year, it may be desirable to trace briefly the development of the federal program, particularly the various legislative acts by means of which it was initiated and then continued from year to year. It is particularly significant to note that there has been an interesting change of thought regarding the program, which has brought about a complete evolution in the purpose or motivating force behind it.

Originally, the federal government's grade-crossing program was undertaken, along with other public works activities, almost solely as an emergency pump-priming make-work measure, and it was generally taken for granted that governmental financing of grade-crossing work was only a temporary expedient, to be abandoned when the emergency had passed. In that event, of course, there would be a reversion to the practice of requiring the railroads to participate heavily in the cost of eliminating grade crossings. However, there has been an increasing trend towards the view that, after all, the public, and not the railroads, is the chief beneficiary of funds spent for the elimination and protection of grade crossings, and that, therefore, it is no more than fair that such work should be financed, in large part at least, with public funds. It is this trend of thought that explains why the elimination and protection of railway-highway grade crossings is now considered an integral part of the government's federal-aid activities, and that there is a strong possibility that the program will be continued indefinitely, irrespective of its value as a pump-priming make-work measure.

Legislative Acts

The policy of making federal funds available for defraying the entire cost (except land, damages and certain others) of railway-highway grade separation struc-

* All photographs by courtesy of the Public Roads Administration.

tures had its inception, it will be recalled, in an act of Congress passed in 1933, and has been kept in force by various subsequent acts that have been passed from time to time. These acts, in chronological order, may be summarized briefly as follows:

- 1933—National Industrial Recovery Act authorized states to use for grade-crossing separation and protection work any part of a \$400,000,000 appropriation for highway purposes.
- 1934—Hayden-Cartwright Act authorized \$200,000,000 to continue the program initiated by N. I. R. A.
- 1935—Emergency Relief Appropriation Act provided \$4,880,000,000 for public works, of which \$200,000,000 was earmarked for eliminating and protecting grade crossings and for reconstructing existing grade-separation structures.
- 1936—Federal-Aid Authorization Act of 1936 authorized federal appropriations for grade-crossing elimination and protection, and reconstruction of existing structures, of \$50,000,000 each for the fiscal years 1938 and 1939.
- 1938—Federal-Aid Highway Act of 1938 authorized \$20,000,000 of grade-crossing funds for fiscal year 1940, and \$30,000,000 for fiscal year 1941.
- 1940—Federal Highway Act of 1940 authorized \$20,000,000 of grade crossing funds for each of the fiscal years 1942 and 1943. (The program initiated by the 1936 act and continued by the acts of 1938 and 1940 is known as the Federal-Aid program.)

It should be mentioned that the grade-crossing funds made available by the foregoing acts have in each case been apportioned among the states on the basis of their respective populations and mileages of highways and railroad lines. The responsibility of administering the funds is vested in the Public Roads Administration of the Federal Works Agency, which must pass on all federal grade-crossing projects and which exercises general supervision over the expenditure of the funds.

The grade-crossing program initiated by the National Industrial Recovery Act of 1933, known as the Public Works program, has about run its course, and activity under this program during the last year was negligible. As of December 31, 1940, a total of 706 grade-crossing elimination structures had been built with N. I. R. A.

Works Program as of January 31, 1941, is shown in the top line of the accompanying table. This table shows that all but \$2,772,865 of the \$200,000,000 grade-crossing fund had been earmarked for individual projects that were covered by approved plans. Thus, it is apparent that this program is nearly at an end, although it may be several years yet before all of the funds have been expended. As of January 31, there were 17 states in which the Works Program allotments had been entirely exhausted, and in each of 19 additional states the unassigned balances were less than \$25,000. However, the state of Georgia, which has been slow in spending its grade-crossing allotments, still had an unassigned balance of \$1,068,062 of Works Program funds.

Examination of the table will show that completed grade-crossing projects undertaken as a part of the Works Program have resulted in the elimination of 2,089 grade crossings, the reconstruction of 392 existing structures and the installation of protective devices at 1,202 crossings, at a total cost of \$195,622,209. Under this program, projects were completed during the last 12 months that involved the elimination of 29 crossings, the reconstruction of 12 existing structures and the installation of protective devices at 87 crossings. As of January 31, the projects that were under construction as a part of the Works Program had a total estimated cost of \$2,981,007, while those that had been approved for construction but which had not yet reached the active stage had a total estimated cost of \$1,161,656.

The Federal-Aid Program

With both the Public Works and Works Program phases of the grade-crossing program now being brought rapidly to a conclusion, it is the Federal-Aid aspect of the work (as authorized by the federal acts of 1936, 1938 and 1940 mentioned previously) that now constitutes the bulk of the activity. The status of this phase of the program as of January 31, is shown in the second line of the table. It will be seen that Federal-Aid projects that have been completed since this phase of the program was started by the Federal-Aid Authorization Act of

Status of United States Works Program and Federal-Aid Grade Crossing Projects for all States as of January 31, 1941

	Completed					Under Construction					Approved for Construction					Balance of Funds Available for New Projects
	Number of Crossings					Number of Crossings					Number of Crossings					
	Estimated Total Cost	Federal Funds	Eliminated by Separation or Relocation	Reconstructed	Protected	Estimated Total Cost	Federal Funds	Eliminated by Separation or Relocation	Reconstructed	Protected	Estimated Total Cost	Federal Funds	Eliminated by Separation or Relocation	Reconstructed	Protected	
Works Program Projects*...	\$195,622,209	\$189,380,134	2,089	392	1,202	\$2,981,007	\$2,721,847	23	8	13	\$1,161,656	\$1,125,154	11	3	32	\$2,772,865
Federal-Aid Projects†...	71,433,140	69,375,476	706	175	1,786	30,611,008	29,350,053	228	59	211	9,902,956	9,448,005	75	16	346	58,754,874‡
Totals.....	\$267,095,349	\$258,755,610	2,795	567	2,988	\$33,592,015	\$32,071,900	251	67	224	\$11,064,612	\$10,573,159	86	19	378	\$61,527,739

*As provided by the Emergency Relief Appropriation Act of 1935.

†As provided by the several Federal-Aid Authorization Acts.

‡Includes apportionment for the fiscal year 1942.

funds, at a total cost of \$33,328,069. Other work carried out under this program included the installation of protective devices at 709 grade crossings.

Status of Works Program

Likewise, the grade-crossing funds that were authorized by the Emergency Relief Appropriation Act of 1935 have also nearly all been spent. All work undertaken under this act is referred to collectively as the Works Program. The status of the grade-crossing phase of the

1936, have resulted in the elimination of 706 grade crossings by separation or relocation, the reconstruction of 175 existing grade-separation structures and the installation of protective devices at 1,786 crossings, at a total cost of \$71,433,140. As of January 31, projects having a total estimated cost of \$30,611,088 were under construction, while others having a total estimated cost of \$9,902,956 had been approved but had not yet been undertaken.

That the Federal-Aid program is moving along at a substantial rate is indicated by the fact that the projects

completed during the 12 months ending with January 31, 1941, resulted in the elimination of 256 crossings, the reconstruction of 57 existing structures and the installation of protective devices at 957 crossings. These projects involved a total estimated expenditure of \$28,636,971, which is only slightly less than the estimated cost—\$31,232,747—of Federal-Aid grade-crossing projects that were completed during the previous 12-month period, that is, the year ending January 31, 1940.

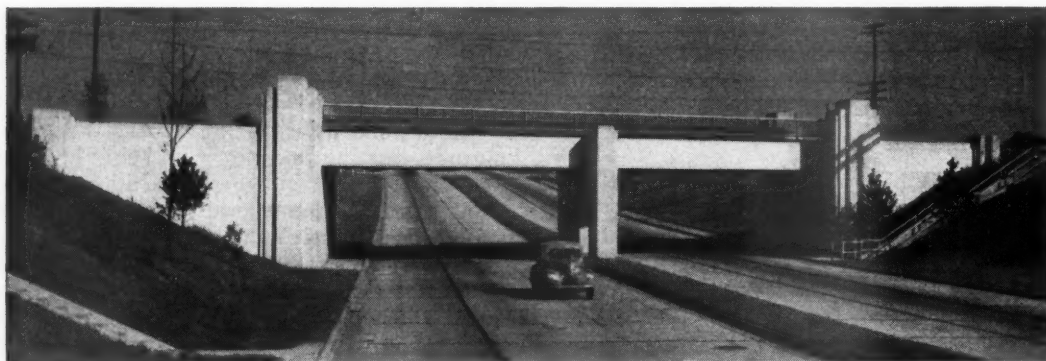
Combined Totals

The totals shown in the table indicate that the grade-crossing work that had been completed as of January 31 under both the Federal-Aid program and the Works Program had resulted in the elimination of 2,795 crossings, the reconstruction of 567 existing structures and the protection of 2,988 crossings. All these projects involved a total estimated expenditure of \$267,095,349. In addition, projects involving a total estimated expenditure of \$33,592,015 were under construction, while other projects having a total estimated cost of \$11,064,612 had been approved and were ready for the award of contracts. Because of the different manner in which the statistics are kept it is not possible to add to the above figures the number of crossings eliminated by projects

behind this trend and into the probable effects that it is likely to have on the grade-crossing program.

During the congressional committee hearings on the Federal Highway Act of 1940, which carried the Federal-Aid authorizations for 1942 and 1943, those who testified, including representatives of the Public Roads Administration, strongly favored authorizing \$50,000,000 of grade-crossing funds for each of the two years, and this figure was proposed when the bill was reported out to Congress. There opposition appeared, which eventually forced the reduction to \$20,000,000 for each of the two years.

This opposition was predicated on a number of considerations. Important among these was a feeling of dissatisfaction among congressmen with the rate at which previous authorizations for grade-crossing purposes were being spent. Also, a desire to effect economies might have been a factor, although it is interesting to note that the authorization carried in the bill for secondary highways for 1942 and 1943 showed an increase as compared with 1941. This increase is attributed largely to political considerations, and in this connection there is a belief in some quarters that the grade-crossing authorizations would have fared better if they had been more actively supported in Congress by the railroads. In fact, the suggestion has been made that it might be help-



This Double-Span Subway Is Located on the Chicago, Milwaukee, St. Paul & Pacific Near Greeley, Ill., and Spans U. S. Highway 41

undertaken under the terms of the National Industrial Recovery Act of 1933.

To recapitulate, the funds that have been authorized for grade-crossing work under both the Federal-Aid program and the Works Program have now reached the impressive total of \$390,000,000, including the authorizations of \$20,000,000 each for 1942 and 1943. As of January 31, the total estimated cost of grade-crossing projects undertaken with these funds—including all completed projects and those under construction or approved for construction—came to \$311,751,976. This figure, it should be noted, includes the costs of right-of-way and certain other items for which federal funds are not available. It embraces projects involving the elimination of 3,132 crossings, the reconstruction of 653 existing structures and the protection of 3,590 crossings.

A Downward Trend

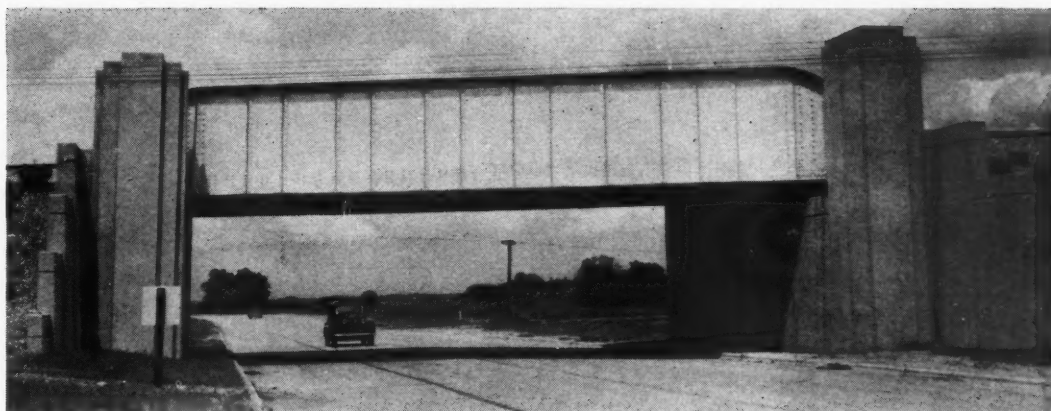
Considerable significance is attached to the fact that the Federal-Aid authorizations for grade-crossing work have been limited to \$20,000,000 each for the fiscal years 1942 and 1943. With these authorizations, the total for the two years is \$40,000,000, which compares with a total of \$50,000,000 for 1940 and 1941 and with \$50,000,000 each for 1938 and 1939. Thus, there is in evidence a distinct downward trend in the amount of money which is being made available by Congress for grade-crossing work, and it is pertinent to inquire into the reasons

ful in obtaining larger authorizations for grade-crossing work if individual railroads were to put forward on their own initiative definite plans or programs for the complete elimination and protection of the crossings on their more important lines.

Answering the contention in Congress that grade-crossing funds previously authorized are not being spent with sufficient rapidity, the argument is advanced that in order for grade-crossing work to be carried out in an orderly and efficient manner it is necessary that there be a considerable back-log of money available. Such a fund, it is contended, would permit a grade-crossing program in a given state to be formulated on an equitable long-range basis and then prosecuted systematically. Also, it is pointed out that many of the smaller grade-crossing jobs were carried out during the early years of the programs when the paramount objective was to get the work under way as rapidly as possible, and that, as a consequence, it is the larger and more costly projects, which are inherently slower of fruition, that remain to be done today.

In the light of these statements, it is interesting to examine the grade-crossing allotments of the various states for 1942 and 1943. It is found that seven states will get only \$97,500 for each of the two years, while in only three states are the yearly allotments more than a million dollars, the highest being \$1,330,044 for New York. Hence, with the annual apportionments in some states being equivalent only to the cost of one moderate-size

**An Underpass Carrying
State Highway 47
Under the Chicago &
North Western at
Woodstock, Ill.**



project, it is obvious that it will be extremely difficult in many states to expend the allotments on an efficient and equitable basis. In fact, one state plans to devote its combined allotments for two years to a single project. There are limitations to this practice, however, as it is required that the allotment for any given year be spent within 12 months after the end of the fiscal year for which it was made available. It seems likely that, in an endeavor to secure the maximum benefit from their reduced allotments, many states will devote an increasing percentage of their funds to the protection of grade crossings.

National Defense

Considerations of national defense are expected to affect the federal grade crossing program in several different ways. For instance, many of the country's highways are designated as routes of principal military importance, and it is expected that, other things being equal, grade crossing projects on such highways will be given priority over those on highways not so designated. Also, the building of numerous army camps, cantonments and munitions plants is necessitating the construction of many local access roads to serve such facilities, and it is expected that grade-separation structures will be constructed on these roads where they are considered necessary to expedite military traffic. However, it is anticipated that Congress will be requested to authorize special appropriations for this work, and that, in general, the states will not be asked to divert their regular Federal-Aid allotments to such projects.

There have been no changes of great importance dur-

ing the past year in the general procedure that is followed in carrying out the federal grade-crossing program or in the rules and regulations that are issued by the Public Roads Administration to govern the expenditure of the funds in the different states. Likewise, no new trend has developed during the year in the design of grade-separation structures, or in the protective devices that are installed at grade crossings.

Delays occasioned in the grade-crossing program by difficulties in the acquisition of right-of-way still constitute the principal "bottleneck" in the prosecution of the program. In an effort to overcome this difficulty, a provision was included in the Federal Highway Act of 1940 authorizing the Reconstruction Finance Corporation to co-operate with the states in financing the acquisition of property that may be necessary or desirable in carrying out projects eligible for federal aid. However, no attempt has been made as yet to take advantage of this provision.

Priority Formula

Probably one of the most significant developments during the year relative to the federal grade-crossing program was the further substantial progress that was made in the development of a formula for determining the hazard ratings of individual grade crossings. In fact, this formula, which is under derivation by the Division of Highway Transport and Control of the Public Roads Administration, has now been developed to the point where it is expected that very shortly it will be issued to the states for trial purposes.

(Continued on page 428)

**This Sharply-Skewed
Underpass, Completed
in 1940, Is Located on
the Great Northern
Near Brewster, Wash.**





The International Amphitheatre, Chicago, Where Members of the National Railway Appliances Association Will Exhibit Railway Work Equipment and Materials, March 10-13, in Conjunction With the A. R. E. A. Convention



New and Improved Products of the Manufacturers

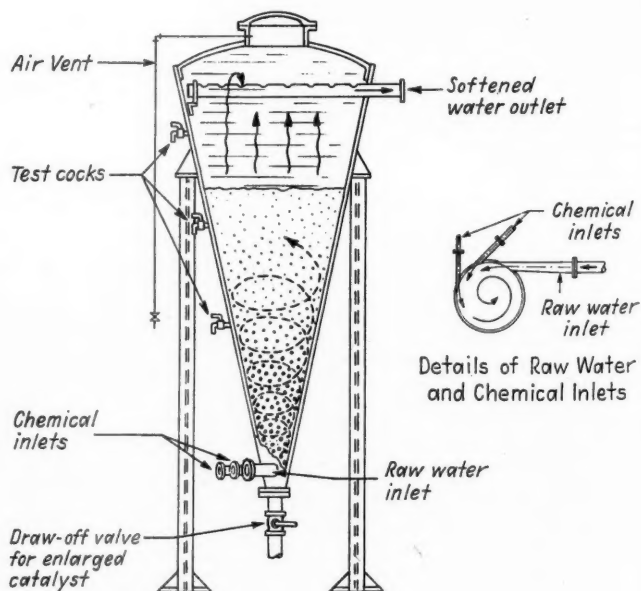
Permutit Spiractor

THE Permutit Company, New York, has developed the Permutit Spiractor, a new cold lime-soda water softener, which employs the principle of catalytic precipitation, greatly speeding up the reaction and eliminating settling and sludge disposal difficulties. The Spiractor consists of a conical steel tank mounted vertically with the small end at the bottom. It is partially filled with a granular catalyst screened to the proper grain size. The raw water and chemicals are introduced tangentially near the bottom, causing a circular or turbulent spiral motion of the fluid and intimate contact with the catalyst as the liquid rises in the Spiractor. Owing to the conical shape of the tank, the velocity of flow in the upper portion is reduced to less than that required to suspend the grain particles of the catalyst. During this period the reaction is taking place and the calcium and magnesium compounds precipitated by the chemicals build up and enlarge the granules of the catalyst. These larger particles gradually settle to the bottom of the tank and are drawn off by a drain valve located at the lower extremity of the cone.

In the upper portion of the Spiractor the clear water is drawn off through an outlet provided for the purpose. The Spiractor is designed to provide a sufficient interval of time from the entrance of the raw water and chemical at the base until it reaches the clarified zone, for the reaction and deposition of the solids on the catalyst to be completed. As the enlarged granules of catalyst and deposited hardness are drawn off at the bottom, fresh charges of the catalyst are introduced into the tank at

the top. The granules that are drawn off can be crushed and re-used as catalyst for further treatment.

The process, which is said to take less than five minutes in the Spiractor, permits the use of a unit of very small size in comparison to the tank required with older methods of cold lime-soda softening. No voluminous wet sludge is formed but instead, enlarged granules, which



A Cross-Sectional View of the Permutit Spiractor

are easily disposed of. In addition, the Spiractor is said to be flexible in operation and readily adjustable to changes in the character of the water; it may be operated under pressure, eliminating the necessity for re-pumping and it has no moving parts to get out of order or require constant maintenance or attention. It may be used with or without supplemental filters. It is said to be adapted particularly to the treatment of locomotive boiler water, where calcium is the principal hardness to be removed, reducing the sludge in boilers and adding the excess alkalinity that it is desired to maintain in such boilers.

New Airco Flux-Coated Bronze Welding Rod

AIR Reduction, New York, has placed two new high-test flux-coated bronze welding rods on the market, which are said to offer a number of advantages for bronze welding, such as low fuming, faster application, a denser deposit, increased tensile and bond strength, increased hardness of deposit, and improved ductility. The flux-coated rods are said to save the time lost in welding work, when bare rods are removed from the molten puddle and dipped into the flux can. The coating on the flux-coated rods is said to adhere well and will not fall off when the rod is bent excessively. The same flux is available in a liquid paste form for those who prefer a bare welding rod.

Two types of high-test flux-coated bronze welding rods are available, the Airco No. 20 (Naval) and the No. 22 (Manganese). Both types may be secured in packages of 5 or 25 lb. and in diameters of $\frac{1}{8}$ in., $\frac{3}{16}$ in., and $\frac{1}{4}$ in.

Allis-Chalmers Model "AD" Motor Grader

THE Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has developed a Diesel-powered motor grader which weighs 21,500 lb., and is adapted for heavy grading, bank cutting, ditching (both forward and reverse) and snow removal.

The new motor grader, Model AD, is designed with a Hi-arch front axle with 22 in. clearance and with $6\frac{3}{4}$ in. clearance between the Roll-away blade and the circle. Power is supplied by a General Motors 2-cycle Diesel engine developing 75 brake hp., which has unit injection, four-way cooling, and air, oil and fuel filters. The transmission has short, heavy shafts and carburized and hardened gears. A range of six forward and three reverse speeds are provided; with throttle control, forward speeds

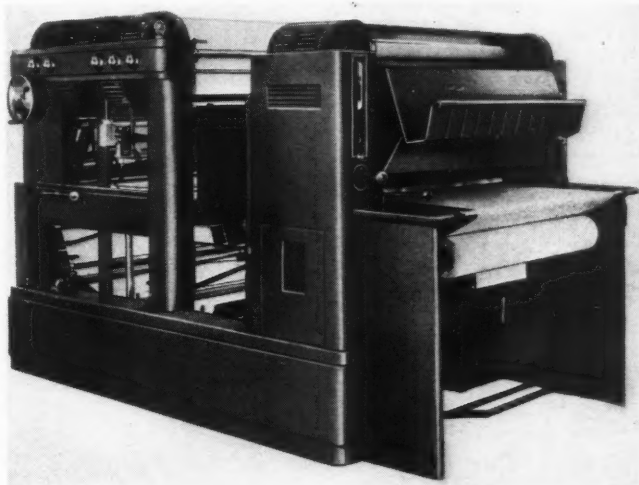
range from 1.48 to 16.6 m. p. h. and reverse speeds from 1.75 to 6.15 m. p. h.

The 10-in. tubular frame with its heavy box section girders is said to be the strongest grader frame built. The lift cases are mounted directly over the circle for rigid blade control. The full revolving blade has a bank cutting angle of 90 deg. and a blade reach outside the front wheels of 5 ft. $7\frac{1}{2}$ in. The tandem drive assembly is chain driven and is supported on a $4\frac{1}{2}$ -in. main drive shaft. Standard equipment includes electric starting and lighting, leaning wheel front axle, adjustable radiator shutters, muffler, a 12-ft. moldboard, 10-ply front tires and 8-ply rear tires.

It is said that the Model AD has more power and earth-moving capacity than any other motor grader and that it has fast acceleration, smooth power and is easy to start. The increased clearance under the front axle and circle of the Model AD permits the full volume of dirt to roll off the blade without hanging up in the axle or circle.

Pease Model 22-16 Blue Print Machine

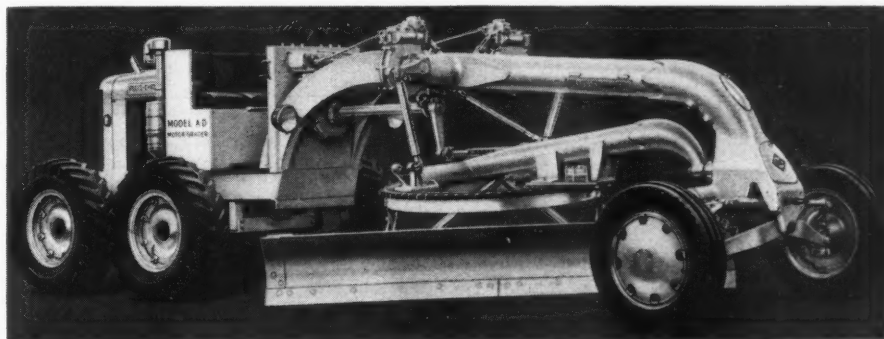
THE C. F. Pease Company, Chicago, has developed a combination continuous blue printing, washing, developing and drying machine, known as the Model "22-16," which is a combination of its Model 22 printer operating in conjunction with its Model 16 dryer.



The Model "22-16" Continuous Blueprinting, Washing, Developing and Drying Machine

The Model 22 printer has a speed of 24 ft. per min. Light is furnished by Actinic arc lamps which are said to burn for 45 min. and resume instantaneously without

The Allis-Chalmers Model AD Motor Grader Is Adapted for Heavy Grading, Bank Cutting, Ditching and Snow Removal

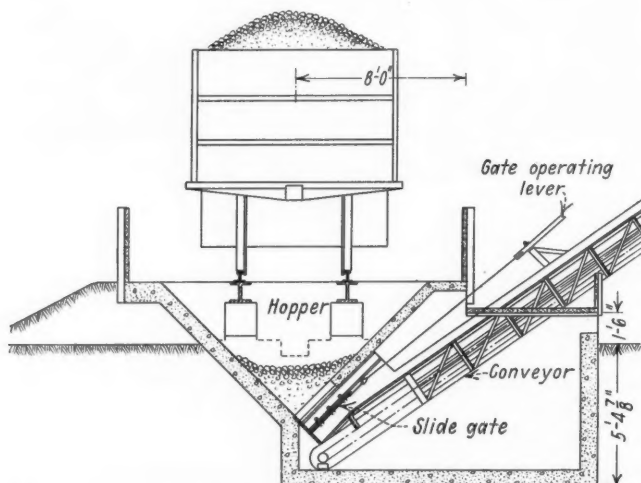


interruption. A three-speed lamp control switch is provided for operation of the lamps on 10, 15 or 20 amperes, which permits the speed of the machine to remain the same, variations in tracings being compensated for by adjustment of the lamps. A sliding contact is provided which smooths out the inequalities in the tracings and provides an uninterrupted exposure area of $24\frac{3}{4}$ in.

The Model 16 washer and dryer has a speed of 15 ft. per min. This is claimed to be an economical advantage because the 24 ft. per min. speed of the printer can be used only with the large prints and it also permits the use of slow blueprint paper, which produces better and more permanent blueprints. The washer and dryer has a horizontal water wash that floats the exposed paper horizontally, free from tension and wrinkles and a quick-change chemical applicator, which is said to provide a change over from blueprints to negatives, or vice versa, in thirty seconds and which provides a method of applying potash to one side and hypo to both sides of the paper. Five eight-inch aluminum drying drums, heated either with gas or electricity, provide gradual drying without distorting the paper.

New Design of Direct Locomotive Coalers

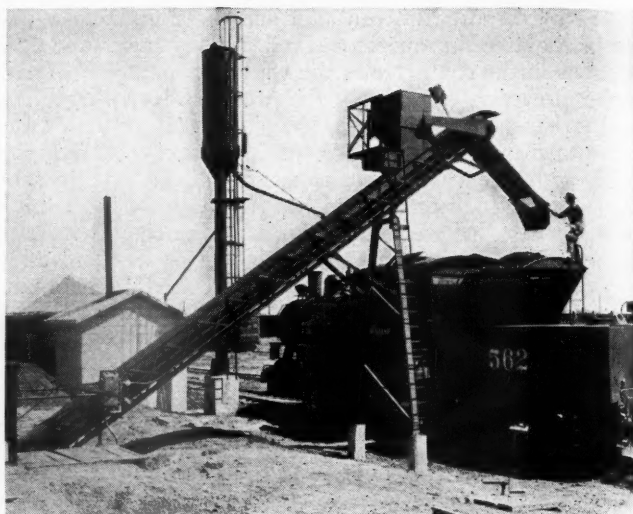
THE Ross & White Company, Chicago, has developed a new arrangement of its "Red Devil" drag-bar-type direct locomotive coaler in which the conveyor is fed directly from the coal receiving hopper, without the use of an intermediate motor-driven mechanical unit. In this new design, the conveyor extends down to a gate-covered opening at the bottom of the receiving hopper, where the coal flows directly into its boot end without the aid of a car unloader or measuring feeder. The whole unit is built on permanent concrete foundations outside of A. R. E. A. clearance lines, and



Section Through Track Coal Hopper, Showing the Lower End of the Conveyor and the Sure-Slide Gate

is operated either from the ground level or from the tops of engine tenders. The push-button control for operation from engine tenders is located on the side of the counterweighted pivoted apron which directs the flow of coal into the tender, which is elevated out of clearance limits when not in use.

A special feature of the new direct coaler is the gate controlling the flow of coal to the conveyor. This gate,



One of the New Design Red Devil Direct Engine Coalers, with Push-Button Control From Locomotive Tenders

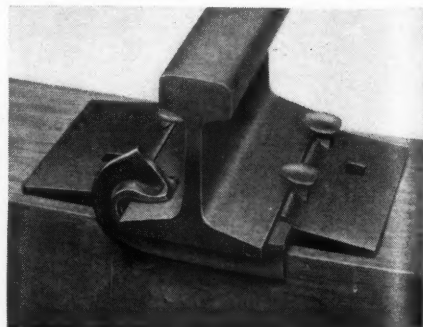
known as the Sure-Slide gate, is a heavy-duty over-cut type of roller gate, of such construction that it closes of its own weight, without binding, and cannot be fouled by the accumulation of coal dust. To effect these features, the gate, which provides a 24-in. opening when the conveyor is operating to capacity, operates on rollers outside the limits of the gate opening. The rollers are carried on extension bars and operate on the lower legs of steel channels, turned outward, away from the gate, to prevent fouling.

It is said that the new coaler, which has a capacity of 60 to 80 tons an hour, can handle coal of any size up to run-of-mine, equally effectively. As noted in one of the accompanying illustrations, the conveyor and operating equipment are covered with a shingle-type steel cover, which keeps the inside of the unit dry under all weather conditions.

The Improved Fair Rail Anchor

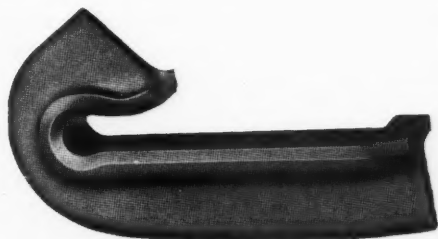
THE improved Fair rail anchor, with new features which are designed to add greatly to its efficiency, is now being placed on the market by the P & M Company, Chicago. The new anti-creeper is made from high carbon, heat-treated steel rolled to a special tee section which is said to permit greater refinement of heat treating and give greater strength. The tee section, flanged on both sides, enables the anti-creeper to accommodate itself to various bearing requirements. It will bear against the tie plate only, where the tie plate covers

Improved Fair Anchor in Place, Showing Bearing Against Both the Tie Plate and Tie



the entire face of the tie; it will contact the tie only, where the edge of the tie plate sets back from the face of the tie more than a given distance; or it will contact

The Improved
Fair Anchor



both the tie and the tie plate, where the edge of the tie plate sets back from the face of the tie a normal distance.

Because it will accommodate itself to these various bearing requirements and because it has a greater bearing area than any anti-creeper previously manufactured by this company, it is said that the creeping load is evenly distributed, and undue wear of the tie is eliminated. Several million of the Improved Fair anchors have already been placed in service, and it is reported that the service records to date are very satisfactory.

Barco Type-"X" Flexible Ball Joints

THE Barco Manufacturing Company, Chicago, has developed a new Type-"X" flexible joint for use in locomotive blow-down, filling, washing and direct steaming lines in and about enginehouses and shops, and, in fact, for use in any lines where provision



7BX-8BX
Flange Angle Joint
90° Ball



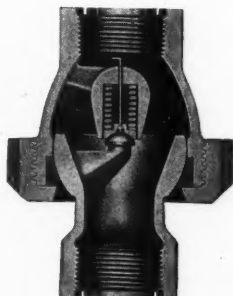
7BX-8AX
Flange Angle Joint
45° Ball



7BX-8X
Flange Angle Joint
Straight Ball



7AX-8BX
Angle Joint
Angle Both Ends



Interior of
7X-8X
Joint



7X-8BX
Female Joint
90° Ball

A Group of Barco Type-"X" Flexible Joints, Including a Cut-Away Interior View Showing the Principal Features of Their Construction

must be made for flexibility or excessive expansion. These new joints, which supplement the company's standard two-gasket type flexible ball joints, are said to incorporate a number of improvements over the standard joints in the form of greater flexibility, increased strength and wearing qualities, and automatic adjustment to com-

pensate for wear and expansion and contraction encountered with varying temperatures.

The outstanding feature of the Type-X joints is a spring support of the ball on a single gasket at exactly the center of the ball, so that the ball receives the maximum amount of pressure to hold it against the gasket, with the minimum amount of friction and resistance to angular movement in the joint. The spring in the joint is of stainless steel, heat set, and is located in a shroud attached to the casing by a streamlined lug, which protects the spring to a large degree from the erosive action of the stream of fluid passing through the joint. Through these features, and the fact that the spring does not flex under any circumstances, remaining static except as it may lengthen slightly as the gasket wears, it is said that manual adjustment of the joints is entirely eliminated. Since manual adjustment is unnecessary, extra heavy square threads are provided between the nut and the joint casing, increasing the strength and wearing qualities of the joint at this point, and permitting the nut to be screwed up to a thoroughly tight position.

Another feature of the Type-X joint is that it provides approximately one-third more flexibility or angle movement than the standard two-gasket joints, so that fewer of the Type-X joints will give the same amount of flexibility as a greater number of the two-gasket type. The new joints are available in the sizes most generally required for pressures up to and including 300-lb., in both bronze and malleable iron.

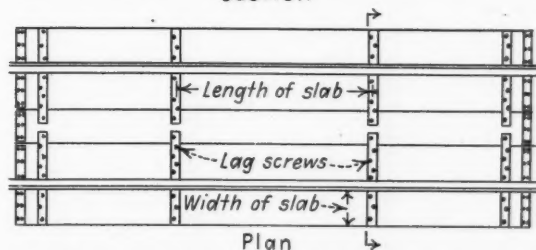
Laminex Sectional Railroad Crossings

THE Wheeler Lumber Bridge & Supply Company, Des Moines, Iowa, has developed a Laminex sectional crossing for use at railroad-highway crossings, that is said to have long life, low maintenance costs and to be easily removed for track work. The crossing consists of sections of yellow pine or Douglas fir strips, two inches wide and 3, 4 or 5 in. high, depending upon the rail height and crossing requirements. The strips are given a pressure creosote treatment and are assembled in sections approximately 16¼ in. in width and 8 or 10 ft. long, using 16d galvanized nails. The ends of the end sections are beveled and protected with a metal end plate fastened with heavy wood screws. The sections rest directly on the ties or on wood shims placed on every tie to bring the top of the sections level with the top of the rail.

Anchor plates are provided at the ends of the sections, set flush with the surface. Long lag screws extend



Section



Plan

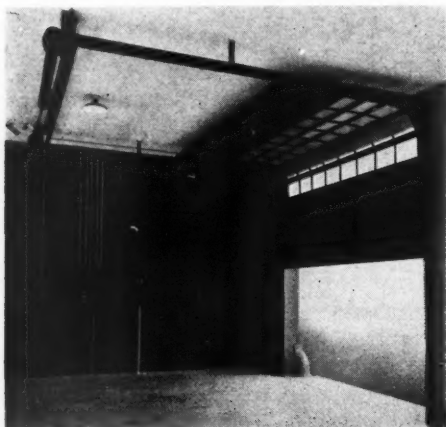
A Plan and Section of a Laminex Crossing

through the anchor plates and sections into the track ties. The anchor plates are specially designed. Those for the sections between the rails bend downward at the flangeway and extend under the base of the running rail. Those on the outside sections hook under the ball of the running rail. At the center of the crossing a two-inch gap is allowed between the ends of the anchor plates to prevent shorting signal circuits. A rail laid on its side with the base against the side of the crossing sections and the ball against the web of the running rail, provides the flangeway.

It is said that these sections with the edge grain of the timber exposed are much tougher and more durable than ordinary flat grain plank, that the method of assembly prevents the splitting and cracking of the timber, and that the sectional design permits flexibility in the crossing without disintegration. In addition, the sectional design permits quick removal and replacement for track work.

Improved RoL-Top Doors and Safety Control Device

SINCE their introduction about three years ago, numerous improvements have been made in Kin-near RoL-Top doors to insure their maximum strength and efficiency in operation, and these doors are now available in sizes and styles to meet almost every condition. In addition, motor-operated RoL-Top doors



One of the Improved RoL-Top Industrial Doors in a Partially Opened Position

can now be equipped, if specified, with an automatic safety control, which checks their downward movement in case they strike an obstruction of any kind.

RoL-Top doors are built of either wood sections or steel panels, which are hinged together horizontally and fitted at both ends with heavy-duty ball-bearing rollers. By means of these rollers, which operate in steel tracks or guides, mounted on the jamb and extending horizontally back from the lintel, the door, when being opened, rolls to an overhead horizontal position, without any obstruction to floor space. One or more springs connected to the door by plow steel cables counterbalance it accurately, and a special sealing device and a heavy cylinder lock make it weather-tight and prevent unauthorized openings.

In the RoL-Top doors constructed of steel sections, the sections are approximately 18 in. high and are rolled from heavy-gage sheets that have been given a protective zinc coating by the Tite-Cote process. Especially reinforced at load-bearing points, these doors are said to

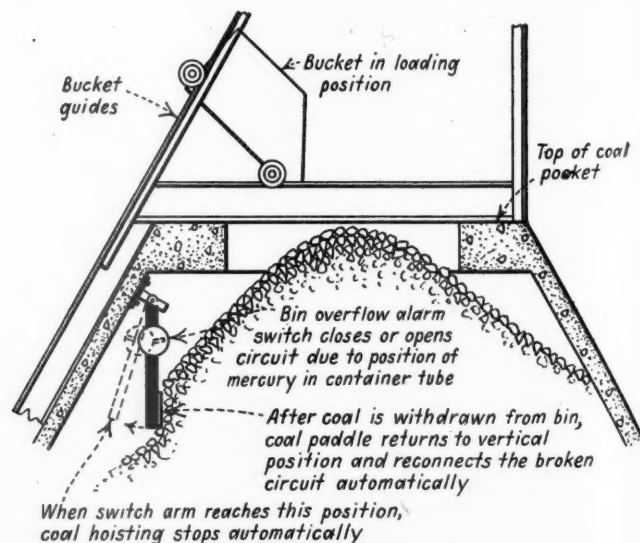
be strong and durable, will not warp, split or pull apart, and are highly resistant to the elements. Both the wood and steel section doors can be provided with glass panels, as desired, to improve building interior lighting.

The automatic safety control available for the motor-operated doors consists of a compressible, air-containing weatherstrip, which is placed along the entire bottom edge of the door. If this weatherstrip strikes an obstruction when the door is being closed, it is compressed. This forces air from the strip through an impulse switch, causing the door to stop in its closing travel, or to revert to its fully-open position, depending upon the method of connection to the door control circuit.

Coal Pocket Overflow Safety Switch

TO prevent the overfilling of the coal pockets of overhead storage-type locomotive coaling stations, with the possible damage that might result to the elevating buckets or other coaling plant machinery, the Ross & White Company, Chicago, has developed and is installing in its coaling stations a new design of bin alarm switch, which automatically cuts out bin-loading operations when the coal has reached a predetermined maximum level. The new switch is based on the use of a mercury tube electrical contact switch fixed on a vertical, free-swinging arm suspended inside the coal storage compartment. The switch-supporting arm is equipped with a paddle at its lower end so that when a predetermined coal level within the compartment is reached in filling operations, the coal engages the paddle and forces the arm out of its vertical position.

The mercury tube switch in this arrangement is so fixed to the suspended arm that when the arm hangs in a vertical position, which it can do only when out of contact with coal in the bin, the mercury in the switch stands at one end of the switch tube where it closes the circuit in the coal hoisting power line, enabling operation of the skip bucket and hoist at the will of the station operator. When the switch-supporting arm is forced out of the vertical position by the coal as the bin capacity is reached, the mercury in the switch flows to the opposite end of its tube, breaking the electrical circuit in the hoist power line and thus stopping coal hoisting operations.

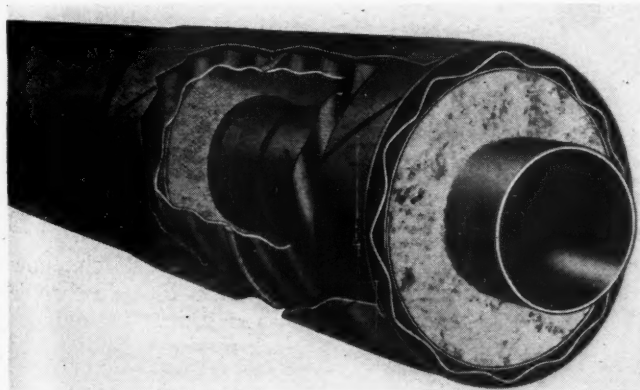


Sketch Section of a Coaling Station Bin, Showing the Typical Location and Operation of the Overflow Safety Switch

When coal is withdrawn from the bin to a locomotive tender, the switch-supporting arm resumes its vertical position, the mercury flows back to the contact end of its tube, and the hoist power circuit is again closed, permitting the operation of the hoist at the will of the operator. Thus, the overflow safety switch is automatic in operation, except that when coal elevating operations have been stopped automatically, it is desirable that the operator cut out the normal hoist control switch so that hoisting operations will not be resumed automatically, with possible danger to someone working about the coal-hoisting machinery.

Ric-Wil Insulated Pipe Units

THE Armco Railroad Sales Company has recently placed on the market new sealed and insulated pipe assembly units known as Ric-Wil pre-sealed insulated pipe units which are designed particularly for underground steam, return and hot water lines. The



Cutaway View of a Ric-Wil Insulated Pipe at a Joint Connection

pipe units consist of one or more steam, return or hot water pipes incased in any kind of standard insulation, such as 85 per cent magnesia or laminated asbestos spongefelt in recommended thickness. The service pipe and insulation are incased in heavy-gage galvanized Armco Hel-Cor conduit which is coated on the outside with a thick layer of asphalt and wrapped to a smooth finish with asbestos-asphalt saturated pipe line felt. The inside pipes are supported on semi-steel full guided ring

supports placed not over 10 ft. apart. The pipes within the units are said to be free to contract and expand on the ring supports without stress or wear to the insulation. The units are made in 20-ft. lengths, completely assembled ready for installation and can be ordered in special lengths if required.

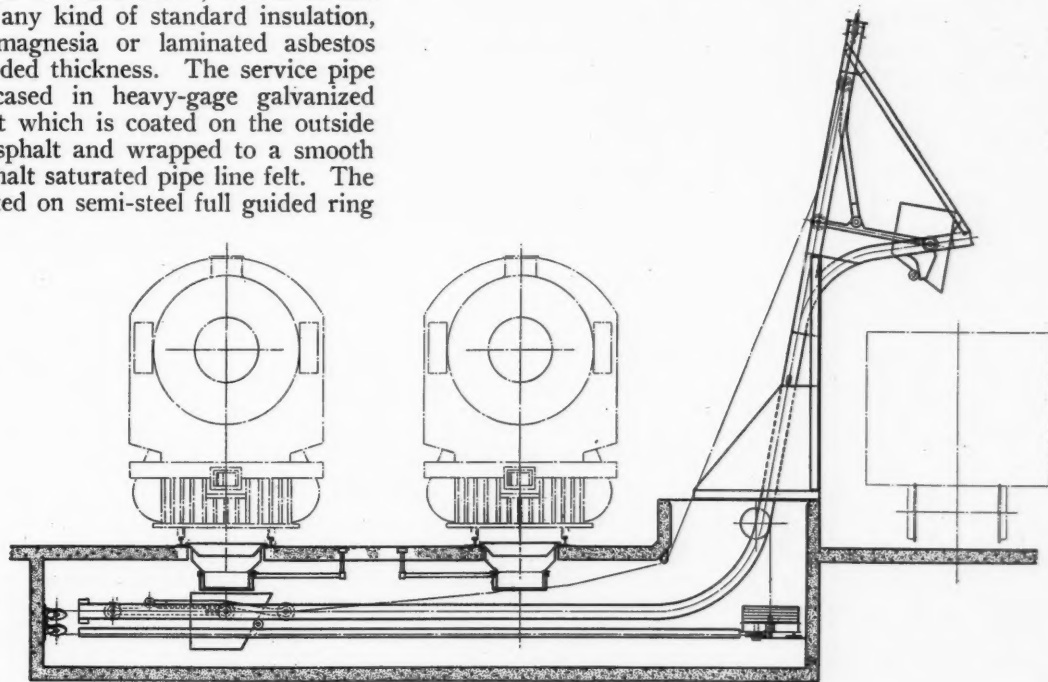
The Ric-Wil units are usually connected by butt welding the service pipes and applying an Armco Ingot Iron coupler over a wrapping of heavy asbestos felt which is placed around the insulation between the units. Special fittings, such as elbows and tees, are available.

The Ric-Wil units are said to provide fully watertight insulated construction that will give long life and withstand considerable abuse, frost action and external loads and for that reason need not be installed in deep trenches. Tests are said to show that the helical lock seam possesses ample strength and is positively watertight.

Whiting Electric Cinder Conveyor

THE Whiting Corporation, Harvey, Ill., has designed an electric cinder conveyor to serve one or multiple service tracks, a number of which have been installed within the past year.

This cinder conveyor has an electrically operated drum and cables which operate the bucket. The bucket travels on steel channels or tracks that extend under the railway tracks to be served and up over the loading track and automatically dumps at the unloading position. The driving mechanism is located at the ground level for easy and safe inspection and maintenance. When more than one track is served, the machine is equipped with a retrieving line counterweight, associated parts and a limit switch arrangement for stopping the bucket or dump car at a designated position automatically. For either single or multiple track installations, the machine is under limit control for both the upper and lower positions. The conveyor is made in two sizes, with a 50-cu. ft.



A Sectional Scale Drawing of a Whiting Electric Cinder Conveyor

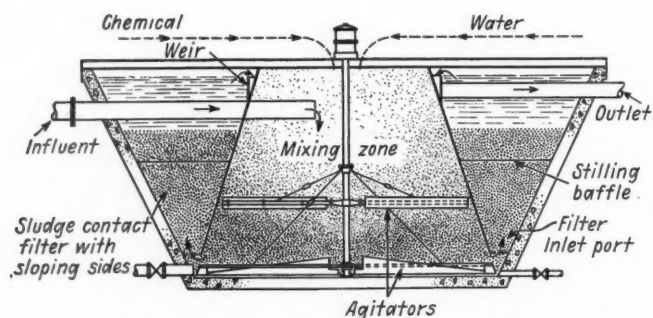
bucket or an 80-cu. ft. bucket. The track hoppers have a capacity of 90 cu. ft., measure approximately 12 ft. in length and are equipped with a positive acting hopper door.

The Whiting conveyors are said to be of simple design with few rugged parts. The chutes, aprons and baffle plates are eliminated at the discharge point of the cinders and the wheel bearings of the bucket are fully enclosed and dust-proof. Clearance is maintained at all times and the tip of the bucket in the dumping position is 16½ ft. above the base of the rail. The hoppers are of large capacity and have the necessary extra length to handle large locomotives.

Permutit Spaulding Precipitator

THE Permutit Company, New York, has developed Permutit Spaulding Precipitators for the cold lime or lime-soda treatment of water, which are said to reduce the time required for treatment, accomplish the desired softness with a lower chemical dosage and eliminate the necessity for settling beds and sludge removal equipment.

The Permutit Spaulding Precipitator is designed chemically and hydraulically to make use of two well known principles: chemically, to pass the water through suspended sludge particles formed from the previously treated water, to provide intimate contact of the solution



A Cross-Section Drawing of a Standard Precipitator Showing Direction of Flow

and the solids, to hasten the precipitation and to increase the size of the precipitated particles into larger coagulated masses; and hydraulically to use the stabilizing effect of an upflow suspended filter bed of sludge.

Briefly, the Precipitator consists of a downdraft mixing chamber and an upward flow sludge filter and clarification chamber. Many forms of precipitators have been devised to fit almost any size and shape of tank or basin, depending on local conditions but the essential features are agitator blades in the mixing chamber to provide thorough mixing of the raw water and chemicals and a flared or conical shape of the sludge filter chamber, in which the rate of flow decreases as the treated water rises. Stilling baffles are employed to eliminate turbulence in the latter chamber, and the sludge filter separates from the clarified water at a definite level, depending upon the upward rate of flow and the concentration of the particles. As the particles of the sludge filter become coated with the finer particles rising into the filter section, they gradually become larger until the upward velocity is no longer sufficient to retain them in the filter section. These particles then fall back into the mixing

zone, so that there is a continuous flow of suspended particles from the mixing zone into the filtering zone and a flow of larger particles in the opposite direction. This results in a condition of equilibrium which maintains approximately the same concentration in both the mixing zone and the filtering zone. Sludge concentration pockets with outlets are provided for the removal of a portion of the concentrated and settled sludge. The process is continuous and a softened water with low effluent turbidity is obtained.

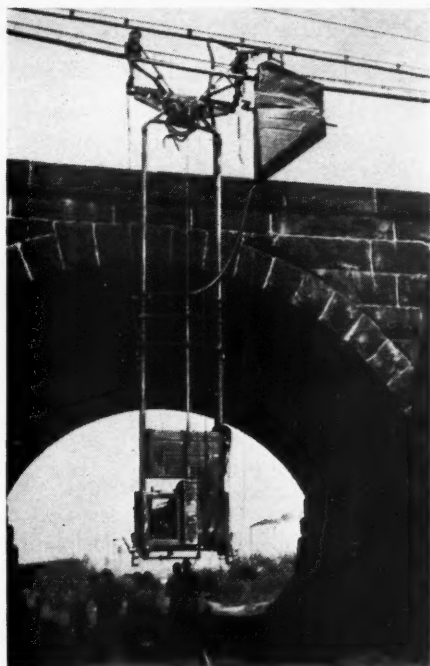
A number of designs of precipitators are possible. In some cases several precipitators are operated in series or in parallel, with a saving in time or in the amount of chemicals used to produce the desired softening. It is said that a more complete reaction in a shorter time is obtained with the use of less chemicals, as compared to the ordinary cold lime or lime-soda treatment. The lime treatment in the Precipitator is said to reduce the carbonate hardness of the effluent to such an extent that frequently the further use of soda-ash to reduce non-carbonate hardness is unnecessary or, if the non-carbonate hardness of the raw water is high, the reduction in carbonate hardness permits the use of less soda-ash than was formerly required to produce the same total reduction in hardness. Another important advantage claimed is the fact that no complicated sludge removal system is necessary and the effluent is remarkably clear, reducing the load on the filters.

Engineers Pattern Chrome Clad Steel Tapes

THE Lufkin Rule Company, Saginaw, Mich., now offers a complete line of Engineers Pattern chrome clad steel tapes, with a width of ¼ in. These tapes are chromium plated, with jet black markings. They are free of glare and easy to read, as well as being rust-resisting and easy to keep clean. The Engineers chrome clad tapes are offered in two weights, the sturdy medium and the extra heavy, marked either in feet, tenths and hundredths or in feet, inches and eighths. A wide variety of cases, reels and frames are available, including the Ranger medium weight chrome clad line in a leather case, the Wolverine reel with the extra heavy line, the Peerless with the medium weight line and the four-arm metal reel with the lock handle and the Western heavy tape with a similar reel assembly.

Traveling Unit Applies NO-OX-ID Cablekote

THE Dearborn Chemical Company, Chicago, has devised a self-propelling coating machine for applying NO-OX-ID Cablekote to the messenger strand, armoured cable and accessories, eliminating the former difficulty of application involving hand labor. The machine travels on the messenger wire and in one operation coats the wire, armoured cable and rings with NO-OX-ID Cablekote at a speed of approximately 40 ft. per min. It is said that the machine, which was used on one large Eastern railroad last year, applies a uniform coating over the entire messenger assembly, including the contact area between the bottom of the armoured cable and the rings, which is superior to that obtained by hand methods. In addition to doing a better job, the

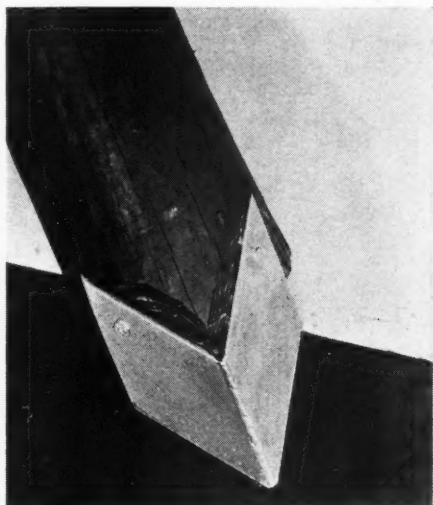


The Cable Coating Machine in Operation

machine is said to increase production, with reduced attendant labor, thereby decreasing costs. The cable-coating equipment for the application of NO-OX-ID Cablekote and an operator are furnished by the Dearborn Chemical Company on a contract basis.

Morrison All-Steel Pile Driving Shoe

IN the interest of speeding up and cutting the cost of pile-driving work, while at the same time preventing the loss of strength in timber piles through booming and splitting, especially when they are being driven through difficult ground, Morrison Metalweld Process, Inc., Buffalo, N. Y., has developed an all-steel pile shoe which is readily applied to piles in the field and which is proving highly effective. The new shoe, which is fabricated from two sections of steel plate, bent and welded to form a four-sided point with four wings, is designed to be slipped over the sharpened end of the pile and



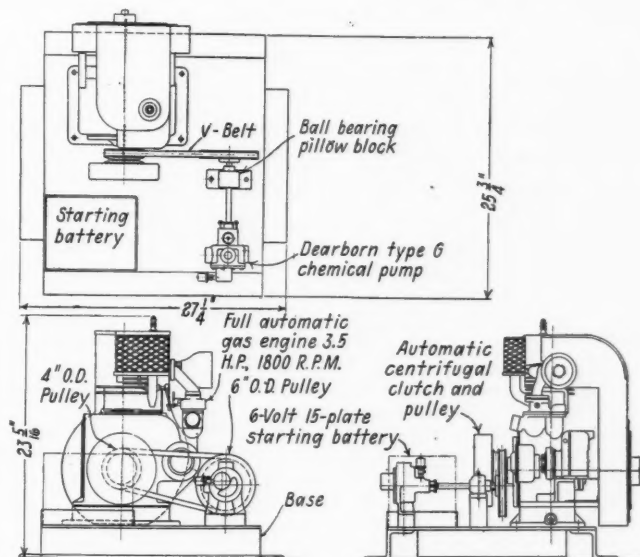
One of the All-Steel Pile Shoes in Position on a Timber Pile Point

fastened in place by means of nails driven through holes provided in the points of the four wings. The shoes for wood piles are made in two sizes, for piles 5 in. to 9 in. in diameter, and for those 10 in. to 13 in. in diameter. In those cases where the shoe is a little large for the size of pile to be driven, it is intended that the wing points shall be hammered back into position against the pile to conform to its shape, which can be done without danger of breakage.

For use with concrete piles, a more or less similar pile shoe has been developed, which is in the form of a four-sided pyramid, with a section of reinforcing rod projecting axially from its tip to act as an anchor in the concrete of the pile. This type shoe is placed in the form, and, as the concrete for the pile is poured, becomes an integral part of the pile itself. It comes in only one standard size, but can be furnished to any specifications desired.

Automatic Engine-Driven Chemical Feed Pump

FOR the automatic feeding and proportioning of water-treating chemicals at water stations not served by commercial electric power, the Dearborn Chemical Company, Chicago, has developed a chemical pump—gasoline engine unit, which is fully automatic in operation. The pumps of these units are Dear-



Plan and Side and End Elevations of the New Dearborn Fully-Automatic, Gasoline-Engine-Operated Chemical-Feed Pump

born Type G pumps, which are available in capacities from 1 to 10 gal. per min., while the gasoline engines are of the air-cooled type of $3\frac{1}{2}$ hp. at 1800 r. p. m. The gasoline engine drives the pump by means of a "V" belt and pulley, and an automatic, centrifugally-operated clutch between the engine and the driving pulley permits the engine to get up to normal operating speed after starting, before the pump load is thrown onto it.

The automatic starting equipment of the unit consists of a 6-volt, 11-plate battery, a Startix unit, a 6-volt electric starter and generator, a relay for controlling the engine magneto, automatic choke for carburetor, and an ammeter. Automatic actuating of the starting equipment may be by a pressure-control switch, a flow switch,

or a float or limit switch, as desired, making the unit adapted for either tank-type treatment, or for the automatic introduction of treating chemicals directly into water columns or tank spouts as locomotives are taking water.

Improvements in Lima Super-Paymaster

THE Lima Locomotive Works, Inc., Lima, Ohio, has made a number of improvements in its Paymaster convertible crawler shovel, dragline or crane, now called the Super-Paymaster, to improve its balance and ease of operation. In addition, the Super-Paymaster may now be equipped with a $7\frac{1}{2}$ -kilowatt generator and an electro-magnet for handling steel and



The Super-Paymaster Equipped with Generator, a 35-Ft. Boom and an Electro-Magnet

scrap iron. The Super-Paymaster is a $\frac{3}{4}$ -cu. yd. combination crawler shovel, dragline, crane or pull shovel. When equipped as a crane, it has 13 tons capacity and as a shovel it is equipped with an 18-ft. boom of all-steel box construction and a 15-ft. single seamless-type dipper handle. The boom hoist is independent and chain or cable crowd can be furnished as desired. The swing clutches are of the external expanding band type, toggle-operated with housings 17 in. in diameter and 6 in. wide.

It is said that proper balance has been stressed particularly in the Super-Paymaster to obtain the greatest possible capacity for the weight, that ease of operation has been improved, that the unusual size of the clutches assures smooth accurate control and that the crawler trucks, with modern welded construction throughout, are exceptionally strong and stable.

DIFFERENCE BETWEEN THE GAGE of railroads of Soviet Russia and of Nazi Germany (the latter being standard and the former five-feet) make through transit between the countries difficult, requiring trans-shipment between cars. Under existing arrangements between Soviet and German governments, interchange is made at only five stipulated points, the most important of which is Przemyśl, according to the office of the American Embassy at Berlin. Two new freight yards have recently been built on the German side of the city for change of lading between cars.

Federal Grade-Crossing Program Makes Steady Headway

(Continued from page 419)

To derive the formula, an analysis was made of a total of 3,563 crossings in 29 states, the object being to determine the relationship between the number of accidents at the crossings and the various factors influencing them, namely, the density of the highway and railway traffic and the character of the protection afforded in the form of crossing signs and other devices. While the formula is not yet ready for publication, it can be said that it has the form of a series of charts from which values can be obtained quickly for computing the hazard rating for any crossing for which the density of the highway and railway traffic and the character of the protection are known.

It is expected that the formula will prove of value in helping to establish the relative priority with which the grade crossings in a given group should be eliminated. In this connection it is contemplated that it will be used only as one of several factors to be considered in determining the priority of crossings for elimination or protection—in other words, it will be employed as a means of helping individual states to plan their grade-crossing programs.

Poppet Valves Prove Capacity on P.R.R. Test Plant at Altoona

(Continued from page 410)

the cylinders of 69,430 lb. per hour and a net water evaporation of 70,585 lb. of water per hour. The maximum drawbar horsepower of 3,934 was developed at 56.8 miles an hour with a virtual cut-off of 49 per cent. The machine efficiency in this test was 95.6 per cent. Several other tests equalled or slightly exceed this one in machine efficiency, but 1,188 lb. of friction drawbar pull was the lowest recorded in any of the tests.

The maximum boiler output was obtained at 100 miles an hour and 33 per cent cut-off. In this test the net evaporation was at the rate of 77,480 lb. of water per hour, of which 76,208 lb. passed through the cylinders, developing 4,099 i. hp. Maximum economy was obtained in a test at 85.2 miles an hour with a virtual cut-off of 22 per cent and a net evaporation of 48,716 lb. of water an hour. The locomotive developed 3,191 i. hp. with a cylinder consumption of 15 lb. of steam per horsepower-hour.

A selection of indicator cards representing several speeds and cut-offs are reproduced in Fig. 11. The best single indication of the effect of the characteristics of the poppet valve (i. e., quick opening and closing with a high percentage of full port areas between these events) is shown by the card selected from test No. 941 at 100.1 miles an hour and 22 per cent virtual cut-off. This card developed a mean effective pressure of 52 lb. per sq. in. and the indicated horsepower was 3,502.

Indicated horsepower calculations were made from the conventional steam-engine indicator cards. A qualitative comparison of these cards with those taken at the same time with electric indicators is shown in Fig. 12. The electric indicator, the measuring element of which is a diaphragm free from the effect of inertia forces, produces a smooth card with the events clearly defined. These cards are considered conclusive evidence that the irregularities of the cards from the conventional indicator are caused by conditions inherent in the indicator itself and do not reflect pressure irregularities in the locomotive cylinder.

New Books . . .

The Railroad Problem and Its Solution, by John E. Muhlfeld. 289 pages. 8¾ in. by 5½ in. Bound in cloth. Published by the Devin-Adair Company, New York. Price \$3.

The author of this book is the well-known consulting engineer who, prior to taking up consulting practice in 1919, had a long and varied career in railroad mechanical departments, serving as superintendent motive power, Baltimore & Ohio, between 1903 and 1908. He introduced the Mallet articulated locomotive to this country while he was with the B. & O.; and is credited with a number of important contributions to steam locomotive design, especially for utilizing high steam pressures in multiple-expansion cylinders.

His book is in two parts. The first starts with "General Information"—presenting a number of observations on what ails the roads, following which a chapter of recommendations appears for every agency which can affect the problem—(1) railroads themselves, (2) federal and state governments, (3) I. C. C., (4) R. F. C., (5) organized labor, (6) traveling and shipping public, (7) equipment companies, and (8) investors. The second part is a series of chapters on a number of separate topics, including, among others, plant capacity, earnings, motive power, passenger service costs and operating ratios. These are, on the whole, unevenly balanced, some of them covering wide ground in general terms, while others are highly specialized.

Mr. Muhlfeld's book is more important in its expression in characteristic fashion of the personal opinions of one of the country's best-known motive power officers than as a comprehensive analysis of the railroad problem. Its author has some very definite opinions, frequently expressed: That, for example, the Diesel locomotive has yet to show its superiority in road service;

and that small roads are generally better operated than large. But, generally speaking, many of his statements lack the support of adequate citations of supporting evidence. In fact, the amplitude of the subject-matter is too great to admit of such treatment in a volume of this size.

Railways and the Equipment and Supply Industry, by P. Harvey Middleton. 142 pages. 9 in. by 6 in. Bound in cloth. Published by the Railway Business Association. Price \$1.

The Railway Business Association has released for distribution this revised edition of a book originally prepared by its secretary for the annual meeting of the Association in New York on November 14, 1940. The original 100-page brochure was reviewed in detail in the *Railway Age* of November 9, 1940.

The principal changes in this revised edition are improvements in format, addition of a subject index and the inclusion of supplementary information on certain subjects, several of which did not receive separate headings in the original. Specific additions include detailed information on thermal treatment of rails, automatic train control, cab signals, car retarders, centralized traffic control, interlocking and research carried on by railroads and equipment companies.

The book is especially valuable in taking a new angle on the history of development of devices which make up modern railroading. Whereas most previous works treat each development in terms of personalities, as a part of railroad history generally, Mr. Middleton's work presents step-by-step details of the participation of various equipment companies in their development.

* * * *

B. & M. Runs New "Airliner" Buses

The Boston & Maine Transportation Company has recently placed 12 new vehicles in service. Two 37-passenger buses of the type shown at top were placed in service in June on the Boston (Mass.)-Laconia (N. H.) route while ten 29-passenger vehicles shown at bottom were installed on the busy Boston-Manchester (N. H.)-Concord run at the beginning of the year. All were manufactured by Yellow Truck & Coach.

Five of the 37-passenger type have also been placed in service this year by the Maine Central Transportation Company out of Portland, Me.



NEWS

What Is Value of a Sec. House?

In figuring minimum wages of section hands, credit for free housing is limited

In a proceeding involving the Atlanta, Birmingham & Coast, Harold Stein, examiner of the Wage and Hour Division, has recommended to the Administrator certain findings relative to costs of furnishing housing facilities which may be reported as part of the wages paid to maintenance-of-way employees. This proceeding, the first of its kind under the Wage and Hour Act, arose out of a petition filed by the railroad company with the Administrator asking that such a determination be made.

The housing furnished the employees of the A. B. & C. is divided into four types, Class I houses (two-room units); Class II houses; Class III houses (two-room unit); and boxcars. After a detailed discussion of the original cost of the structures, the depreciation, cost of maintenance and taxes, Examiner Stein makes the following determination of the annual cost of furnishing the four types of housing to the A. B. & C. employees:

Class I houses	\$34.88
Class II houses	31.12
Class III houses	27.56
Boxcars	16.69

The examiner also finds that the amount of money paid to municipalities for water actually furnished to section laborers may be regarded as the reasonable cost of furnishing water, but that the company does not incur any cost in furnishing old ties to its employees for use as fuel.

At the hearing held before the examiner on October 17, 1940, the company submitted the following schedule which it felt should be allowed as the cost of furnishing the various types of housing:

Class I houses	\$100.40
Class II houses	81.52
Class III houses	63.85
Boxcars	49.73

These figures contrast with the annual charges which the company had been deducting from wages for housing prior to the hearing. They are as follows:

Class I houses	\$68.85
Class II houses	56.61
Class III houses	39.78
Boxcars	33.66

The examiner points out that the latter figures differ from those proposed at the hearing in that they were based upon a lower figure for cost of reproduction new, a lower depreciation charge, a lower tax

\$191,050,215 Net Income After Charges in 1940

Class I railroads of the United States in 1940 had a net income, after payment of interest and rentals, of \$191,050,215, the Association of American Railroads announced on March 5. For the twelve months of 1939, Class I roads had a net income of \$94,745,129.

and insurance charge, and a lower estimate of maintenance expenditure.

At the same time General Philip B. Fleming, Wage and Hour Administrator, has issued a notice to employees of the A. B. & C. informing them that any employee who believes that these amounts are too high or too low may ask the Administrator's representative to reconsider his decision if some new facts can be shown which were not considered before. The notice also points out that an employee may ask the Administrator himself to decide whether the representative's decision was right or wrong. Inquiries from employees, says the notice, should be sent to the Wage and Hour Division, Witt Building, 249 Peachtree Street, Atlanta, Ga. Employees are also told that any who write in are protected by the law against losing their jobs or any other form of discrimination.

Equipment Depreciation Orders

Equipment depreciation rates for nine railroads have been prescribed by the Interstate Commerce Commission in a new series of sub-orders and modifications of previous sub-orders in No. 15100, Depreciation Charges of Steam Railroad Companies. The railroads involved are: Alabama Central; Atlantic & Western; Bellefonte Central; Buffalo, Union-Carolina; Laramie, North Park & Western; Mississippi Morristown & Erie; Norwood & St. Lawrence; St. Clair Tunnel.

University of Nebraska to Hold Third Conference

The University of Nebraska will hold its third annual transportation conference in Lincoln, Neb., on April 7. Interterritorial freight rates will be the chief subject of the conference. Speakers whose appearance has already been confirmed include David E. Lilienthal, director of the Tennessee Valley Association, Henry A. Palmer, editor of the Traffic World, and L. C. Sorrell, professor of transportation at the University of Chicago.

Mich. Employees Fight the Ditch

Railroad league distributes literature exposing uneconomic nature of project

Pamphleteering, one of the oldest instruments of controversy in a democracy, is coming more and more into its own in the St. Lawrence Seaway fight. Added recently to the already large output of literature by both sides is a group of short statements for wide public distribution issued by the Railroad Co-operative League of Michigan, and a critical analysis issued by the National St. Lawrence Project Conference.

The Michigan league, a state-wide organization of railroad employees and citizens, the largest of its type in the country, carries on education in transportation fundamentals on a down-to-earth basis in practically every local community in Michigan. It was active in opposing the St. Lawrence scheme when last it was up for Congressional consideration in 1933; the effect of its work was demonstrated by widespread "grass roots" opposition to the project at that time in Michigan, based on a popular understanding regarded as extraordinary by many observers.

The most recent ammunition passed out by the League are three, short four-page pamphlets which together cover the situation thoroughly. A reprint of an article by Professor L. H. Haney of New York University in the "Detroit Times" entitled "The St. Lawrence Project—Why, and Why Now?" makes the point that outside of Mr. Roosevelt and his official family there is no real active support for the project. "I submit that, in view of the Passamaquoddy Bay and the Florida ship canal record, this is not adequate support."

It questions also whether there is need for power and navigation of this type and declares that, if there is, there are far quicker ways to get them.

The two other pamphlets originated with the League itself. One, "The Fictitious Glamour of the St. Lawrence" is an ironical piece stripping the mask off the fancy and emotional language used by the ditch-diggers such as "the marriage of the oceans and the lakes" and "an outlet to the sea." The latter slogan, the pamphlet avers, implies that a great percentage of the present Great Lakes tonnage "seeks the sea." Actually less than 5 per cent of lakes traffic

(Continued on page 436)

Vermont Report Avoids the Issue

Findings of state transport study body ignore truck subsidy question

A joint transportation commission of members of the Vermont Public Service Commission and Railroad Tax Board appointed in April, 1939, to study the "various instrumentalities of transportation" in the state and recommend changes in regulation and taxation thereof has rendered a report to the state legislature which passes by the pivotal issue of subsidy to highway transportation because the evidence is conflicting but recommends higher registration fees for the heavier trucks and broader regulation for motor carriers for hire. The commission would give the railroads limited concessions in their property tax burden but holds in disfavor any levy of personal property tax on motor vehicles which the railroads contended is necessary to equalize the support of general government costs by transportation agencies.

The five-member body held meetings and correspondence with various state and federal officers, including a representative of the Federal Public Roads Administration, and scheduled public hearings lasting about 20 days at which representatives of the railroads, motor transport, shippers and public appeared (see the *Railway Age* for May 18, 1940, page 857). The Vermont railroads and Vermont Truck & Bus Association each submitted recommendations which became the point of departure for the commission's investigation. The special desires of the general public were also sought, but beyond the general opinion that both types of transportation are essential "from no source were any specific recommendations received."

Although it was appointed chiefly to investigate the question of taxation and its blood-brother — subsidy — the special commission refused to take any definite stand on these questions on the grounds that: (1) the area of railroad and truck competition is national, and state measures would only affect the problem slightly; and (2) evidence presented was inconclusive. On this point the report reads: "Since it was unable to come to any conclusion as to whether or not motor vehicles are subsidized because of the conflicting evidence of experts, the Commission has been guided by a realistic viewpoint in suggesting remedies which, it believes, are not impractical or impossible. The arguments and statistics presented on each side were founded upon certain basic assumptions which were irreconcilable, and the Commission was unable to accept either set of assumptions *in toto*."

In line with this attitude, the commission fails to recommend a personal property tax on motor vehicles "in the same manner and at the same rate as similar taxes are now imposed upon the personal property of the railroads," which was a major equalization device proposed by the railroads. Reason given is that "many of the motor vehicle operators, both private and commercial, are

at present paying to the limit of their ability so that any increase in fees or taxes would tend to decrease rather than increase state revenue, and that, while a sharp increase might aid railroads, it would to the same extent penalize the trucks and would not be in the public interest." In a somewhat equivocal statement following the commission states that while it does not favor "diversion" of highway funds, it holds it preferable to a property tax "if it should be deemed advisable to obtain a contribution of funds for the support of general government from motor vehicle sources."

Pacific Club to Hold Annual Banquet

To inaugurate its silver anniversary year, the Pacific Railway Club will hold its 24th annual banquet at the Palace hotel, San Francisco, Cal., on March 13. Principal speakers will be C. E. Johnston, chairman, Western Association of Railway Executives, and J. F. Craemer, member of the California Railroad Commission.

"Casey Jones" for Male Chorus

An arrangement of the famous folk-song "Casey Jones" for a chorus of men's voices has been published by the E. C. Schirmer Music Company, Boston, Mass. Arranged by Edward B. Lawton, this edition carries the song through nine stanzas of the original version.

Rail Investments in Highway Motor Vehicle Enterprises

The Interstate Commerce Commission, Division 1, has again called for the reporting by Class I steam railways, excluding switching and terminal companies, of information regarding their investments in highway freight and passenger operations. The order, dated February 27, requires that the returns be filed in accordance with the form in Statistical Series Circular No. 28.

Commission Reopens Short Line Claim Cases

Acting under authority recently granted it in the enactment of the so-called "deficit bill" by Congress, Division 4 of the Interstate Commerce Commission has issued orders reopening claims filed under section 204 of the Transportation Act of 1920, for further consideration and disposition in accordance with the new law.

The "deficit law" adjusts the basis for settlements of certain short-line claims growing out of the federal control period. The call for such legislation on the part of the interested short lines having come as a result of the Interstate Commerce Commission's action in changing its interpretation of the term "deficit" as used in section 204 of the Transportation Act of 1920. In disposing of early claims, the commission interpreted "deficit" to mean the difference in net income as between the test period and the federal control period; later the regulatory body held that short-line claims could be made only for actual operating deficits. The new law writes the former interpretation into the statute books but fixes limits on the amount that any short line may recover.

House Gets Lea Forwarder Bill

Hearing opens March 11; Joint forwarder-truck rates must go March 16

Hearings will begin March 11 before the House committee on interstate and foreign commerce on H. R. 3684, the comprehensive forwarder-regulation bill introduced last week by Chairman Lea after the Interstate Commerce Commission had set March 16 as the date for the discontinuance of existing joint-rate arrangements between forwarders and motor carriers. As noted in the *Railway Age* of March 1, page 394, the commission late on February 27 granted the two-weeks respite after it had announced on the forenoon of the same day that it had denied petitions for a further postponement beyond February 28 of the effective date of the orders involved.

Because it is unlikely that any legislation for the regulation of forwarders could be enacted before March 16, the consolidators will from that day be required to pay the regularly-published tariff rates of the motor carriers whose services they utilize. The commission's action refusing a further postponement except for the time necessary to make the required readjustments came one day after the House committee had authorized Chairman Lea to address to I. C. C. Chairman Eastman a letter requesting a further postponement until September 1. Chairman Lea is not expected to make any further effort to have the commission delay the "crack-down"; nor to push "stop-gap" legislation. In a statement issued when he introduced H. R. 3684, he said: "The commission, apparently, feels that it cannot further assume responsibility for postponing the effective date beyond the sixteenth of March." Previously, Mr. Lea had reviewed developments on the joint-rate matter, asserting that, before the commission's decisions in Ex Parte MC-31 and MC-2200 were issued and upheld by the Supreme Court, "the Motor Carrier Act of 1935 was pretty generally accepted as authorizing the regulation of forwarders."

As noted above, H. R. 3684 would provide comprehensive regulation for forwarders by the I. C. C.; but the regulation would be more to the liking of the agencies regulated than would that provided in the pending S. 210 introduced recently in the Senate by Senator Reed, Republican of Kansas, on behalf of himself and Chairman Wheeler of the Senate committee on interstate commerce. "The policies in the bill that I introduced," said Mr. Lea's statement, "were those approved by representatives of the forwarding and trucking industries." He wanted it understood, however, that "neither I nor the members of this committee are committed to the specific provisions of the bill"; but "the House committee is still anxious to enact needed legislation on this subject as promptly as possible."

The Lea bill would embody its provisions into a Part IV of the Interstate Commerce (Continued on page 438)

January's N. O. I. Was \$62,357,404

4.55 per cent return compares with \$46,012,810 or 3.35 per cent last year

Class I railroads of the United States in January had earnings [net railway operating income] of \$62,357,404, before interest and rentals, according to the Bureau of

ating expenses totaled \$36,746,631, an increase of 3.6 per cent above January, 1940, but a decrease of 22.3 per cent under January, 1930.

Class I roads in the Western district in January, had earnings of \$17,081,481, before interest and rentals, a return of 4.42 per cent; in January, 1940, their corresponding earnings were \$9,260,088, or a return of 2.4 per cent, and in January, 1930, they were \$14,129,598 or 2.76 per cent. Gross in the Western district in January amounted to \$131,457,593, an increase of 11.2 per cent above the same month last

CLASS I RAILROADS—UNITED STATES

Month of January

	1941	1940	1930
Total operating revenues	\$377,374,190	\$345,639,123	\$445,920,950
Total operating expenses	268,958,882	257,395,976	352,338,745
Taxes	35,519,072	31,243,291	28,939,753
Earnings before charges	62,357,404	46,012,810	54,645,698
Operating ratio—per cent	71.27	74.47	79.01
Rate of return on property investment—per cent....	4.55	3.35	3.81

Railway Economics of the Association of American Railroads. This was at the annual rate of return of 4.55 per cent on their property investment. The corresponding earnings in January, 1940, before interest and rentals, were \$46,012,810 or 3.35 per cent, and in January, 1930, they were \$54,645,698 or 3.81 per cent.

Gross operating revenues in January totaled \$377,374,190, compared with \$345,639,123 in the same month last year and \$445,920,950 in January, 1930, an increase of 9.2 per cent in 1941, above 1940, but 15.2 per cent below 1930. Operating expenses in January amounted to \$268,958,882 compared with \$257,395,976 in January, 1940, and \$352,338,745 in January, 1930. The January expenses were 4.5 per cent more than in 1940, but 23.7 per cent below January, 1930.

Class I roads in January paid \$35,519,072 in taxes, compared with \$31,243,291 in the same month last year, and \$28,939,753 in January, 1930. Nineteen Class I roads failed to earn expenses and taxes in January, of which eight were in the Eastern district, five in the Southern district, and six in the Western district.

Class I roads in the Eastern district had earnings in January of \$34,822,453, before interest and rentals, a return of 4.55 per cent; in the same month last year, their corresponding earnings were \$30,405,241 or 3.97 per cent, and in January, 1930, they were \$32,939,155 or 4.92 per cent. January gross in the Eastern district totaled \$192,588,433, an increase of 6.9 per cent compared with January, 1940, but a decrease of 15.2 per cent compared with January, 1930. Operating expenses totaled \$134,276,591, an increase of 4.5 per cent above the same month in 1940, but a decrease of 23.7 per cent under January, 1930.

In the Southern district the earnings in January were \$10,453,470, before interest and rentals, which was at the rate of 4.75 per cent. In January, 1940, the corresponding earnings were \$6,347,481, a return of 2.89 per cent, and in January, 1930, they were \$7,576,945 or three per cent. Gross for January in the Southern district amounted to \$53,328,164, an increase of thirteen per cent compared with the same month last year, but a decrease of 10.3 per cent compared with January, 1930. Oper-

ating expenses totaled \$36,746,631, an increase of 3.6 per cent above January, 1940, but a decrease of 22.3 per cent under January, 1930.

Resources Board Has Report on "Defense" Highways

President Roosevelt said at his February 28 press conference that he had sent the Public Roads Administration's special report on "defense" highways to the National Resources Planning Board for review. As noted in the *Railway Age* of February 22, page 362, the P. R. A. report called for legislation and appropriations totaling \$287,000,000 "for immediate defense highway construction and the planning of post-emergency highway improvements."

Approves Merger of Teche Lines Into Greyhound Corporation

Merger into the Greyhound Corporation of the operating rights and property of Teche Lines, Incorporated, has been approved by the Interstate Commerce Commission, Division 4. The same decision authorizes Greyhound to issue \$197,850 of installment equipment-mortgage promissory notes in connection with Teche obligations to be assumed as a result of the merger.

Teche, which has been controlled by Greyhound, operates bus services in Georgia, Alabama, Florida, Mississippi, and Louisiana.

Representation of Employees

The International Brotherhood of Electrical Workers, operating through the Railway Employees' Department, American Federation of Labor, has been certified by the National Mediation Board as the duly designated representative of electrical workers in the Northern Pacific's telegraph and telephone maintenance and construction department. Prior to the recent election which the International won by a vote of 44 to 29, the workers involved had been represented by the Association of Telegraph & Telephone Maintenance & Construction Employees, Northern Pacific Railway Company.

Traffic Forecast By Commodities

Defense body experts expect '42 total traffic at peak, but not on the railroads

Ralph Budd, transportation commissioner of the National Defense Advisory Commission, on March 3 released from Washington, D. C., the details by commodities of the 1941 and 1942 carloading estimates he had given in his February 24 address before the Western Society of Engineers. That address was published in the *Railway Age* of March 1, page 385.

As there noted, the figures presented by Mr. Budd indicate an increase of 9.4 per cent in total carloadings in 1941 as compared with 1940, and an increase of 16.9 per cent in 1942 as compared with 1940. On that basis railroad traffic in 1942 would be about three-fourth that of 1929, although the Defense Commission's bureau of research and statistics believe that total 1942 traffic of all transport agencies will probably be the largest ever handled.

The basic figures for commodities affecting 60 per cent of all railroad carloadings were furnished Mr. Budd by the bureau of research and statistics. Their estimates were translated into carload equivalents by the Association of American Railroads, which also estimated other commodities based on the bureau of research and statistics' study. Included in the overall estimate are defense and civilian requirements, in United States and British purchases.

Bituminous coal loadings are expected to increase 690,931 cars in 1941 compared to 1940, or 12.4 per cent. In 1942 bituminous coal is expected to show an increase of 1,465,422, or 26.3 per cent. Iron ore loadings in 1941, says the bureau, may exceed 1940 by 535,849 cars, or 30.1 per cent; in 1942 they are estimated at an increase of 902,577 cars over 1940, or 50.7 per cent. Lumber, shingles and lath are expected to increase 125,142 cars, or 18.2 per cent in 1941, and 198,028 cars, or 28.8 per cent in 1942. The estimated increase for refined oils and gasoline is 88,175 cars, or 7.2 per cent in 1941 and 173,901 cars, or 14.2 per cent in 1942.

The bureau believes that iron and steel shipments of all kinds will increase 326,440 cars in 1941, or 30 per cent over 1940, while the 1942 increase would be 524,589 cars or 48.5 per cent. Cement loadings for 1941 show a prospective increase of 115,501 cars or 22.3 per cent, while 1942 shows an increase of 182,324 cars or 35.2 per cent.

The bureau feels that automobiles, trucks and parts, including tires, will show an increase in 1941 of 204,270 cars or 31.7 per cent. In 1942 the estimated increase would be 330,217 cars or 51.2 per cent. Lastly, scrap iron and scrap steel loadings will show an increase in 1941 of 79,141 cars, or 26.6 per cent, while in 1942 the rise will be 128,827 cars, or 43.3 per cent.

The statement of Mr. Budd goes on to point out that because of inherent difficulties in any attempt at long-range forecasting, these estimates undoubtedly will be revised from time to time to give effect to

changes as they occur. Mr. Budd also warns that defense requirements that would interrupt coast-wide shipping would make the indicated estimates "far too small."

Meanwhile the March 4 issue of the Defense Commission's official bulletin reviews such transportation developments as the increasing car supply, the upward trend in carloadings, the response of the railroads to heavy shipments of automobiles, and plans for handling grain and ore movements. Among other things the review told of Mr. Budd's reports showing that as a result of new purchases and repair programs there was on February 1 a net increase of 109,375 serviceable cars as compared with September 1, 1939. And, despite the higher level of loadings, "substantial freight car surpluses continue to be reported." As to the demand for 50-ft. automobile cars, "all railroads are following the matter actively in the interest of providing the most prompt and efficient handling of these cars, both in loaded movement and the empty return to automobile-producing centers."

"Major commodity movements which are currently receiving consideration by the Transportation Division," the review said, "are the grain movement and the lake-and-rail iron ore movement." In the former connection plans are under way in cooperation with interested government departments "for a complete survey and for action which will provide additional grain storage facilities where needed." In order that this year's ore movement on the Great Lakes may come up to expectations, arrangements are being made for an extra ice breaker to operate at the Soo Canal. Also, "all indications as to mildness of temperature lead to the hope that it may be possible to start lake navigation April 15 or earlier." On the basis of experience during the 58-year period since 1883, the average opening date of lake navigation has been April 21; the range has been from April 6 to May 14.

Express Revenues Up 5½ P. C. in 1940

Total transportation revenues and other income of the Railway Express Agency for the year ended December 31, 1940, was \$179,372,422, as compared with \$169,980,616 in the previous year, an increase of 5.53 per cent. Operating expenses were \$111,660,648, as compared with \$104,391,284, in the previous year, an increase of 6.96 per cent. Taxes increased 9.2 per cent. Total payments to railroads and other carriers for express privileges were \$59,015,910, as compared with \$57,606,650 in 1939, or an increase of 2.45 per cent.

W. P. A. Builds Rail Lines

The latest issue of "The WPA Week in National Defense" reveals that the Works Projects Administration has assisted in the building of two small railroad lines to link national defense projects with trunk line carriers.

In one case 2,300 WPA workers are completing the construction of a railroad, access highways, runways, a warehouse and garage for the Air Corps Technical School at Lowry Field near Denver, Colo. The railroad, a 14-mile standard gage line,

serves two airports on the reservation and joins the main line of the Union Pacific. First trains will run over the new line this week, according to State Administrator Paul D. Shriver.

Another road built with WPA aid is a five mile line connecting the Boston & Maine with the Army Air Corps' northeastern base at Westover Field, Mass. Freight service has already been inaugurated on this line.

Chicago-Florida De Luxe Coach Trains May Run Year-Round

Operation of the Dixie Flagler, the City of Miami, and the South Wind, which were placed in operation between Chicago and Miami, Fla., in December by nine railroads comprising three Chicago-Florida routes, has been extended from April to May 31, with the possibility that they will be made year-round trains. Decision to continue the trains until May 31 and possibly thereafter is based upon their outstanding performance, which promises to continue beyond the tourist season. Since December, these trains have handled approximately 100,000 passengers with consistently full loadings and with bookings two weeks in advance. Another outstanding phase of their operation is the fact that even though the fare is low, \$41.85 for the round trip from Chicago, and a 1½ cent rate prevails in the south, these trains have earned close to \$3 per mile.

Kendall Keeps After Those 50-Ft. Box Cars

Because the requirements for such equipment are "now stepping up rapidly," Chairman W. C. Kendall of the Car Service Division has advised all railroads of the need for "a more vigilant enforcement" of Special Car Order No. 42 which applies to 50 box cars equipped with end doors 8 ft. 1 in. or wider, and to 50 cars equipped with automobile loading devices.

Mr. Kendall referred to "too many instances" wherein the order's requirements for expedited handling of the 50-footers are "misunderstood or overlooked." The requirements generally are called "exceedingly heavy," while the supply in Michigan for both commercial and government truck loading "continues at an unsatisfactory low level."

January Locomotive Shipments

January shipments of railroad locomotives totaled 64 as compared with 70 in December and 27 in January, 1940, according to reports from builders to the Department of Commerce's Bureau of the Census. Meanwhile, data supplied by the Car Service Division, Association of American Railroads, show that one locomotive (an electric) was built in railroad shops during that month, as compared with seven (six steam and one electric) in December and two (steam) in January, 1940.

The 64 locomotives shipped by outside builders in January included 15 steam, 44 Diesel-electrics and four of other types for domestic service, and one steam for export. Builders had unfilled orders at the end of January for 455 locomotives, including 129 steam, two electrics, 240 Diesel-electrics and 44 of other types for

domestic service, and 28 steam, 10 electrics and two of other types for export. Locomotives on order in railroad shops as of February 1 totaled 18, including 13 steam and five electrics.

"City of Midland" Will Make First Trip March 12

The streamlined car ferry, "City of Midland," which is being constructed by the Manitowoc Shipbuilding Company for the Pere Marquette, will make its maiden voyage on March 12. As reported in the *Railway Age* of October 5, the ship was launched on September 18. After a test run off the Wisconsin shore, the City of Midland, carrying 34 carloads of evaporated milk, will be dispatched from Manitowoc, Wis., by officers of the railway and the builder to Ludington, Mich. The schedule of the maiden trip shows Milwaukee and Kewaunee as the second and third ports of call.

The City of Midland will be operated over the Ludington-Manitowoc route during the late spring and summer when automobile and passenger traffic is heaviest and over the Ludington-Milwaukee route in the late fall and during the winter.

I. C. C. Votes 6 to 5 to Put Pension Act Onto Interurban

In a six-to-five decision the Interstate Commerce Commission has modified a previous decision of Division 3 and found that the Cincinnati & Lake Erie did not fall within the terms of the exemption proviso of section 1 (a) of the Railroad Retirement Act of 1937 and the Carriers Taxing Act of 1937 during the period from August 29, 1935, to and including June 3, 1938, but that since the latter date it has been within the terms of the exemption proviso. Division 3, in a decision of August 27, 1938, had held that the road is "more than a street, interurban or suburban electric railway" and thus is not within the exemption proviso.

Included in the evidence reviewed by the majority in its decision is testimony to the effect that after June 1, 1938 there was a substantial change in the road's freight-handling activities resulting in a considerable diminution of its freight revenues. The prior decision of Division 3 had reasoned that because the carrier exchanged freight with other steam railroads, it was a part of the general steam-railroad system of transportation.

Chairman Eastman dissented, saying that the road was definitely an "interurban electric railway" despite the fact that it exchanged some freight with other steam railroads. "Only by a tortured construction of the statute, repugnant also to its legislative history," wrote Chairman Eastman, "can this carrier be found, as was found in the prior reports, to be or to have been more than an interurban electric railway and a part of the general steam-railroad system of transportation. The fact that such a construction has results which are beneficial to the employees does not excuse it."

Commissioners Porter, Mahaffie and Splawn also noted dissents, while Commissioner Patterson took the position that the road should not have been exempted since June 3, 1938, in view of the fact that

it continued to handle carload traffic until May 31, 1939, and was, until that date, a part of the general steam-railroad system of transportation.

Defense Emergency May Halt Railroad-Fan Activities

Inspection trips of railroad "fans" would perhaps be suspended for the duration of the national-defense emergency if the railroads generally follow a recent suggestion of J. J. Pelley, president of the Association of American Railroads, that A. A. R. member roads withhold permission to inspect facilities from aliens or citizens not duly accredited by appropriate governmental agencies.

Mr. Pelley's suggestion became known in connection with the cancelation of a projected March 2 trip on which the Washington Division of the Railroad Enthusiasts had planned to visit the Southern's Alexandria, Va., roundhouse. While adoption of Mr. Pelley's suggestion would undoubtedly bar all fan trips, it was explained at the A. A. R. that the suggestion was designed primarily to end the practice of allowing representatives of foreign railroads "every courtesy" in inspecting facilities of American roads.

A. A. R. Directors Meeting

Discussions of the pending demand of the non-operating unions for vacations with pay, the possibility of a strike in the soft-coal mines April 1 and the exceptionally large wheat movement expected this year occupied directors of the Association of American Railroads at their February 28 meeting in Washington, D. C. It was stated after the meeting that no action was taken with respect to any of the foregoing matters, or in fact on any matter other than routine internal affairs of the Association.

Ralph Budd, transportation member of the National Defense Advisory Commission, attended the meeting; and he is understood to have told the directors that there is nothing to indicate that any special measures are necessary at this time in connection with transportation and national defense. The rail executives also received the usual report on the car situation, getting data as of February 1 which indicated a net increase of 53,000 serviceable cars as compared with June 1, 1940.

Plan Would Give Some Tax Relief to N. J. Roads

Governor Charles Edison of New Jersey submitted to the legislature on March 5 a report urging certain reductions in state railroad taxes made by an unofficial advisory committee comprised of a college professor, a Chamber of Commerce officer, a C. I. O. leader and an attorney. The report would not permit the railroads to compromise back and unpaid taxes from 1932 to 1940 aggregating \$34,268,000, long in litigation, but would require their payment over a period of years. It would waive certain penalty payments however. Future state taxation it would base on a flat percentage of total value basis, in place of the present method of taxation by classes of property. At the rate of 3 per cent tentatively fixed, this basis would mean

a reduction of \$5,033,690 from the 1940 levy of \$18,296,690. At a rate of 4 per cent a reduction of \$612,691 would result.

In offering the plan the committee declared that railroad taxes "appear to us to be presently too high, especially as compared with the ability of the New Jersey railroads to earn money. If railroad taxes are not reduced we believe that our railroads will deteriorate and become increasingly unable to render efficient service."

Freight Car Loading

Loadings of revenue freight for the week ended March 1 totaled 756,670 cars, the Association of American Railroads announced on March 6. This was an increase of 78,177 cars, or 11.5 per cent, above the preceding week which included the Washington's birthday holiday, an increase of 122,034 cars, or 19.2 per cent, above the corresponding week last year and an increase of 162,246 cars, or 27.3 per cent, above the comparable 1939 week.

As reported in last week's issue, the loadings for the previous week ended February 22, totaled 678,493 cars, and the summary for that week, as compiled by the Car Service Division, A. A. R. follows:

Revenue Freight Car Loading

For Week Ended Saturday, February 22			
Districts	1941	1940	1939
Eastern	152,634	132,739	124,016
Allegheny	151,921	125,675	109,407
Pocahontas	49,989	44,843	40,439
Southern	110,864	92,766	90,156
Northwestern	70,290	68,301	64,523
Central Western	94,113	88,617	86,131
Southwestern ..	48,682	42,442	42,070
Total Western Districts	213,085	199,360	192,724
Total All Roads	678,493	595,383	556,742
Commodities			
Grain and grain products	27,233	31,223	28,879
Live stock	9,662	10,768	9,935
Coal	150,837	135,789	127,772
Coke	14,064	9,867	7,086
Forest products	36,691	30,146	25,493
Ore	12,025	9,810	7,883
Merchandise l.c.l.	139,280	133,908	133,973
Miscellaneous ..	288,701	233,872	215,721
February 22 ..	678,493	595,383	556,742
February 15 ..	721,176	608,237	576,645
February 8 ...	710,196	627,429	576,352
February 1 ...	714,323	647,830	573,127
January 25	710,752	650,187	590,459

Cumulative Total,
8 Weeks 5,564,283 5,046,614 4,571,596

In Canada. — Carloadings in the week ended February 22 totaled 54,168, as compared with 55,093 in the previous week and 46,475 a year ago, according to the weekly statement of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
February 22, 1941....	54,168	28,801
February 15, 1941....	55,093	29,117
February 8, 1941....	52,587	28,818
February 24, 1940....	46,475	23,941
Cumulative Totals for Canada:		
February 22, 1941....	413,696	221,140
February 24, 1940....	377,142	190,753
February 25, 1939....	317,846	167,734

Club Meetings

The Traffic Club of Philadelphia, Pa., will hold a dinner at the Benjamin Franklin hotel on March 10 at which its new officers will be inaugurated. A vaudeville show will follow.

J. C. Stewart, superintendent of stations and transfers, Pennsylvania, will speak on

"Loss and Damage Claims—Prevention and Presentation" at the monthly meeting of Delta Nu Alpha transportation fraternity at the Y. M. C. A., Wilmington, Del., March 12.

F. A. Stevenson, vice-president (operations), American Car & Foundry Company, will present a talk entitled "Speeding Tank Manufacture" at the "Army and Navy meeting on National Defense" of the American Society of Mechanical Engineers at the Hotel Statler, Cleveland, Ohio, on the morning of March 12. His talk will be illustrated by colored slides.

The Eastern Car Foremen's Association will hold its next meeting at the United Engineering Societies building, 29 West 39th street, New York, on March 14 at 8 p. m. K. G. Carpenter, assistant superintendent, car department, Delaware, Lackawanna & Western, Scranton, Pa., will present a paper entitled "Duties of Mechanical Department Supervisors."

Dispatchers Go to Defense Body for Work Relief

The American Train Dispatchers' Association, which has been actively seeking a shorter working day for its members for some time, has taken the unprecedented step of seeking aid for improvement in working conditions from the National Defense Advisory Commission. President C. L. Darling, calling this "new direction of our energies" a logical procedure "because the railroad industry is a most potent factor in national defense" has communicated with Ralph Budd, commissioner for transportation, seeking relief from allegedly excessive work and responsibilities for the dispatchers and aid in setting up a training program for "students."

Citing figures on early retirements of dispatchers because of ill-health and the prevalence of nervous diseases arising from overwork, Mr. Darling's letter declares that there is a shortage of trained "detainers" and regular men are often required to work their rest days and implies that more men should be employed to handle the present load. Mr. Darling claims that new men are not attracted to fit themselves for dispatchers' jobs because of difficult working conditions and failure of management to set up an adequate training program. A similar appeal has also been directed to Paul V. McNutt, coordinator of health, welfare and related defense activities, and to Sidney Hillman, co-director of the Office of Production Management.

Hearing on Dining Car Meal Deductions to Be Held

A hearing on deductions for meals served employees on dining cars, insofar as they affect the 36 cent minimum wage ordered for trunk line railroads which went into effect March 1, will be announced in the very near future, General Philip B. Fleming, Administrator of the Wage and Hour Division, said on March 6.

The Wage and Hour law states that a "wage" paid to any employee includes the reasonable cost, as determined by the Administrator, to the employer of furnishing such employee with board, lodging or other facilities, if such board, lodging or other

facilities are customarily furnished by such employer to his employees." In determining "reasonable cost" as directed by Congress, the administration of the Wage and Hour Law in Regulations Part 531 has stated "reasonable cost does not include a profit to the employer or to any affiliated person."

A survey conducted by the Wage and Hour Division has indicated that the trunk line railroads now making deductions for crew meals do so on different bases, says the Administrator. On the evidence of the hearing, the Administrator will determine a uniform basis for computing deductions.

Any finding as a result of the hearing, General Fleming said, will be in accordance with decisions of the United States courts in Wage and Hour cases that no deduction or charge can be made for meals unless the meals were voluntarily accepted by the employees.

Retirement Board Operations

Retirement benefits totaling \$10,024,464 were certified for payment in December, according to the latest issue of the Railroad Retirement Board's "Monthly Review." Payments certified from the beginning of the retirement system through last December totaled \$368,339,841.

December unemployment-benefit payments totaled "more than \$2,781,000." Applications for unemployment benefits in December averaged 6,181 a week, reflecting "the continued rise in seasonal unemployment in maintenance of way and structures."

The "Review" also reveals that as of June 30, 1940, service with 4,615 companies or organizations had been held creditable toward Railroad Retirement Act benefits. Of that total, 1,590 were carriers subject to the Interstate Commerce Act's Part I, 2,613 carrier predecessors, 141 carrier affiliates, and 26 railway labor organizations. The Retirement Board's general counsel has ruled that news agents paid by carriers on a commission basis are employees under the Unemployment Insurance Act—so long as the carrier has the continuing authority to supervise their service, regardless of whether they are actually supervised or instructed while working. In another opinion, the general counsel has held that insurance secretaries of railroad brotherhoods are employees under the Retirement and Unemployment Insurance acts—"if they are employed in the insurance department of a national railway labor organization employer."

Bills in Congress

A bill "to provide for the protection and conservation of equities or rights accruing to the government because of railroad land grants" has been introduced in the Senate by Senator Sheppard, Democrat of Texas. It is S. 1018, and it would direct the Secretary of the Interior, through the General Land Office, to maintain such records as are necessary to carry out the stated purpose.

Representative Wene, Democrat of New Jersey, has introduced H. R. 3624 to authorize the construction of a canal across New Jersey from Cape May Harbor to Delaware Bay, "in the interest of national

defense." As noted in the *Railway Age* of February 15, page 329, a companion Senate bill (S. 814) was previously introduced by Senator Barbour, Republican of New Jersey.

Senator Gurney, Republican of South Dakota, has introduced S. 974 to amend the Transportation Act of 1940 to provide that there shall be "verification" before payment of federal government freight bills, which that act authorized to be paid prior to audit by the General Accounting Office; and S. 975 to amend provisions of the Motor Carrier Act which cover exemptions for transportation of products of farms.

Another bill (H. R. 3747) to liberalize the provisions of the Railroad Retirement Act has been introduced by Representative Kee, Democrat of West Virginia. H. R. 3755 to recreate the Civil Aeronautics Authority (which one of President Roosevelt's reorganization orders placed in the Department of Commerce) has been introduced by Representative Edith Nourse Rogers, Republican of Massachusetts.

Representative McLean, Republican of New Jersey, has introduced H. R. 3789 "to save daylight and to provide standard time for the United States." Under it daylight saving time would be effective on a country-wide basis from the last Sunday of March to the last Sunday of October each year.

Senator Bilbo, Democrat of Mississippi, has introduced S. 1028 "to promote the national defense" by providing for a high-speed highway from the Great Lakes to the Gulf of Mexico. The bill would authorize a \$20,000,000 appropriation which the Public Roads Administration would spend to make a four-lane through road out of specified existing highways between Chicago and New Orleans, La.

"Southerner" to Go in Service March 25

The Southern expects to place its new streamliner "The Southerner," trains Nos. 47 and 48, in regular service between New York and New Orleans, La., via Atlanta, Ga., and Birmingham, Ala., about March 25, according to Passenger Traffic Manager F. L. Jenkins. Three of the coach trains for this daily service are nearing completion in the shops of the Pullman-Standard Car Manufacturing Company and the Electro-Motive Corporation.

It is expected that about ten days before the trains go into regular service, an exhibition trip will be operated from New Orleans to New York, with stops and ceremonies at intermediate points. The official christening is scheduled for March 17 at New Orleans. Hostesses, chosen from the several states through which the train will run, reported to Washington, D. C., on March 3 to don their blue-green gabardine service uniforms and berets and undergo a course of training under Miss Wanda L. Myers, director of the road's new hostess service. "The Southerner" will leave southbound from New York at 4:37 p. m. and arrive at New Orleans at 8:15 p. m., next evening. Northbound trains will leave New Orleans at 8 a. m., arriving at New York at 2:05 p. m. the next day.

The road is also replacing present equip-

ment on the "Memphis Special," trains Nos. 25 and 26, operating between Memphis, Tenn., and Washington, D. C., via Chattanooga, Tenn., Knoxville, Lynchburg, Va., and Bristol, with new streamlined coaches and Diesel-electric locomotives, on or about April 15. The train will be renamed "The Tennessean." The purchase of equipment for these trains was announced in the *Railway Age* of October 19, page 569 and October 26, page 606.

Western Roads and Brotherhoods to Discuss Vacation Demands

Western railroads on March 5 notified the fourteen Non-Operating Brotherhoods that a recently appointed conference committee, representing the railroads of the West, will meet representatives of the Brotherhoods at Chicago on March 17 to discuss the employees' demand for two weeks vacation with pay and related matters. This action conforms with an offer made eight months ago to handle the employees' request and the railroads' counter request for decreases in rates of pay on a regional basis. The Brotherhoods had sought to have their request considered on a national basis.

The conference committee recently appointed by the Western Lines consists of the following: J. H. Aydelott, general manager of the Chicago, Burlington & Quincy as chairman; J. A. Gillies, general manager of the Western lines of the Atchison, Topeka & Santa Fe as vice-chairman; M. J. Byrnes, assistant to the vice-president of the Northern Pacific; J. D. Farrington, chief operating officer of the Chicago, Rock Island & Pacific; and C. R. Young, manager of personnel of the Illinois Central.

According to a statement made by J. A. Gillies "this formal notification repeats the already stated willingness of the Western railroads to handle these matters concertedly. A strike vote is now being taken by the employees for the ostensible purpose of expediting the handling of their vacation demands, but the facts are that in May, 1940, when these demands were first received, the individual Western lines notified their men of their willingness to handle this matter and the railways counter proposals concertedly in the west. This offer has never been withdrawn: it has remained continuously in effect: and it is now repeated with a definite date suggested for the first regional conference."

High Court Remands Pullman Case to State Tribunal

The United States Supreme Court, at its March 3 session, in the case of Railroad Commission of Texas, Lon A. Smith, Ernest O. Thompson and others versus the Pullman Company and Guy A. Thompson, trustee of the St. Louis, Brownsville & Mexico Railway Company, debtor, and others, reversed a federal district court decision holding invalid an order of the Texas Railroad Commission requiring all Texas trains carrying Pullman cars to have a Pullman conductor in charge of those cars.

The court, in a unanimous decision by Justice Frankfurter, held that the proper place to decide whether or not the commission had the power to make such an

order was in the state courts, and remanded the case to the federal district court for a determination of any federal questions which might arise, while at the same time directing that the question of the commission's power be litigated in the Texas Supreme Court at the earliest possible date.

The Pullman Company and the railroads in Texas assailed the commission's order as unauthorized by Texas law as well as violative of the equal protection, the due process and the commerce clauses of the federal Constitution. The Pullman porters also intervened, adopting these objections, but stressing the added argument that the order was a discrimination against negroes in violation of the Fourteenth Amendment.

"The complaint of the Pullman porters," wrote Justice Frankfurter, "undoubtedly tendered a substantial constitutional issue. It is more than substantial. It touches a sensitive area of social policy upon which the federal courts ought not to enter unless no alternative to its adjudication is open. Such constitutional adjudication plainly can be avoided if a definitive ruling on the state issue would terminate the controversy . . . The last word on the meaning of Article 6445 of the Texas Civil Statutes, and therefore, the last word on the statutory authority of the Railroad Commission in this case, belongs neither to us nor to the district court but to the supreme court of Texas."

Suggests \$58,755,350 for New Rivers and Harbors Work

Expenditures for new rivers and harbors work in the amount of \$57,755,350 could be "profitably" made during the fiscal year ending June 30, 1942, according to the annual report of Major General J. L. Schley, chief of engineers, U. S. Army, which was made public this week. The same report sets up amounts aggregating \$52,411,210 for fiscal 1942 maintenance work on existing rivers and harbors projects.

Among the larger projects in the report's list of projected new work are: Mississippi river between the Missouri and Minneapolis, \$13,940,000; Missouri river, Kansas City to Sioux City, \$7,447,000; New York and New Jersey Channels, \$5,000,000; Delaware river, Philadelphia to the sea, \$3,770,000; Sabine-Neches waterway, Texas, \$2,386,500; Missouri river, mouth to Kansas City, \$2,025,000.

Meanwhile the report reveals that during the fiscal year ended June 30, 1940, the War Department spent \$113,261,344 on rivers and harbors work. During that year work under the rivers and harbors program "has been diligently prosecuted, improvements and maintenance operations having been under way on 385 separate projects and 49 projects were completed." Among the projects is that on the Ohio river where "9-ft. navigation has been maintained throughout the year through the operation of the 46 locks and dams comprising the project, supplemented by seasonal dredging of recurring shoals at obstructive bars." Commercial traffic on the Ohio, the report said, reached "an all-time record of 25,955,345 tons" for the calendar year 1939.

The project for 9-ft. navigation on the upper Mississippi to Minneapolis, involving a total of 26 locks, "has been well advanced to completion by the opening to

navigation of lock and dam No. 24 at Clarksville, Mo., thus making available a 9-ft. draft for long-haul common-carrier service above St. Louis over a distance of some 650 miles." Plans are in preparation for the two locks "required to surmount St. Anthony Falls at Minneapolis, the construction of which awaits the availability of funds."

On the Missouri river the project "for a 6-ft. low-water channel to Sioux City, Iowa, 763 miles above the mouth, is 90 per cent or more completed up to Omaha, Nebr., and 63 per cent thence to Sioux City. . . Deepening of the channel to nine feet has been recommended to Congress" The Fort Peck Dam project as a whole was 92 per cent completed when the report was prepared.

Mich. Employees Fight the Ditch

(Continued from page 430)

is for export at all. Further, neither lake, passenger-cargo or the larger freighters could or would use such a canal. Which leaves only the low-rate, inferior foreign tramp vessels dumping European goods in our interior to enjoy the free transportation subsidy.

The other pamphlet discusses those segments of our population which the project would injure. Even the majority of the so-called "landlocked 40 millions" in the interior oppose it. As for the claim that all who oppose it are selfish, the statement denies that "the interest against the project is any more selfish than is the interest of those who favor it."

"Expense without Recompense" is the title of an eight-page pamphlet embodying "a critical analysis of various aspects of the proposed St. Lawrence River Project," which has just been issued by the National St. Lawrence Project Conference. The pamphlet was issued from the Conference's Washington, D. C., office which is headed by Tom J. McGrath, executive director.

At the same time the Conference issued an up-to-date list of its members, showing that 37 organizations are now participating.

Among other things the pamphlet argues that the project would be "a handicap to defense efforts," and "a vulnerable channel." It also has something to say about "when winter comes"; how much the project would cost; who would pay; and who would lose. "The nation," it says, "would lose by spending huge sums to establish a costly form of transportation which could exist only because the burdened taxpayer would provide and support it, but which would nevertheless disrupt long established and satisfactory commercial arrangements, would intensify transportation problems, would add to unemployment, and would cost all of us many times more than it might save some of us."

Meanwhile in the Congressional Record for February 28, Senator Wiley, Republican of Wisconsin, inserted a resolution adopted recently by the Marinette (Wis.) Kiwanis Club — "commending President Roosevelt for his efforts on behalf of the

St. Lawrence waterway." In the appendix to the same issue of the Record, Representative Sanders, Democrat of Louisiana, extended his remarks to insert letters in opposition which he had received from the Bogalusa (La.) Central Labor Union and the Bogalusa Chamber of Commerce. On the previous day, Representative Schwert, Democrat of New York, had inserted similar letters which he had received from the Buffalo local of the Association of Journeymen Plumbers and Steamfitters; and the Riverside Lodge, No. 294, Brotherhood of Railway Clerks.

In the Record of March 4, Representative Shafer, Republican of Michigan, inserted an opposition resolution adopted recently by the Michigan Federation of Labor.

Interested Citizens Help Compromise Short Line Strike

Two public-spirited citizens of Macon, Ga., are credited with having helped bring contending parties to a compromise, ending a four-day strike of 65 train-service employees of the 92-mi. Macon, Dublin & Savannah on March 2. The strike was called for 6 a. m., February 27, following a break-down in negotiations over a demand by train-service employees that the short line raise wages to the standard scale paid by Class I roads in the territory, and operation of the road was suspended until the men returned to work on the morning of March 3. The M. D. & S. runs an average of eight trains daily, including two passenger. Suspension of service affected construction work at Camp Wheeler, a \$9,000,000 army cantonment nearing completion, which is served only by the short line.

Negotiations on the standard wage demand began on September 27, 1940. National union representatives were brought into the picture on January 22. Services of the National Mediation Board were invoked on January 24, which called a meeting in Washington, D. C., attended by executives of the "Big Four" and J. W. Sexton, general manager. No settlement could be reached and the Board's offer of arbitration was refused. Shortly thereafter strike ballots were distributed.

P. T. Anderson, editor of the Macon "Telegraph" and formerly connected with the Central of Georgia, and Dr. C. C. Harrold, president, Middle Georgia Hospital, both of Macon, acting in the capacity of private citizens, succeeded in persuading the contending parties to meet on March 2. Shortly after midnight a compromise was reached whereby the railroad agreed to grant pay increases of from 25 to 50 cents a day, according to base wage. The road had been paying rates within six per cent of the Southern standard.

General Manager Sexton described the compromise agreement as "satisfactory," declaring that the railroad was not able to grant the wage request in full, because of financial status. E. E. Oster, vice-president of the Brotherhood of Railroad Trainmen, at Louisville, Ky., who headed the union negotiators, told local newspapermen that "both sides made some concessions and I think both sides are satisfied."

The Macon, Dublin & Savannah, while

affiliated with the Seaboard Air Line, is an independently-operated short line connecting Macon with the Montgomery (Ala.)-Savannah (Ga.) line of the Seaboard at Vidalia.

Seeks Review of D. & R. G. W. Abandonment

Senator Johnson, Democrat of Colorado, has introduced Senate Resolution 82, which would authorize and direct the interstate commerce committee to investigate and report to the Senate the facts surrounding the recently-authorized abandonment by the Denver & Rio Grande Western of its narrow-gage line between Antonito, Colo., and Santa Fe, N. Mex. At the same time the Brotherhoods' Rail Service Organization has asked the Interstate Commerce Commission to retain jurisdiction over the abandonment, which was authorized on January 22, 1941, until such a time as a special three-judge statutory United States court in the District of Columbia decides in the Pacific Electric case what authority the commission has regarding labor-protection provisions in abandonment cases. (The Pacific Electric case involves the authority of the commission over labor protection provisions in the matter of the abandonment by the Pacific Electric of a considerable amount of trackage in Los Angeles, Calif., and surrounding territory.)

The resolution alleges that all of the pertinent facts were not disclosed at the hearing and that national defense demands that the line be not abandoned but that it remain serviceable during the present emergency for the transportation of military supplies.

The resolution would direct the committee on interstate commerce to report to the Senate the results of a thorough and complete investigation of the proposed abandonment and all pertinent facts including the practices, the methods, and acts or omissions to act of the Denver & Rio Grande Western in the operation of the narrow-gage branch between Antonito, Colo., and Santa Fe, N. Mex.

Later in the week the Brotherhoods' Rail Service Organization filed another petition with the commission asking it to postpone its order in the case and grant a rehearing to permit the introduction of new evidence, which it promised, would be procured.

In view of the resolution of Senator Johnson and the two petitions of the Brotherhood group, Division 4 has decided to postpone the effective date of its order for an additional 40 days.

Jones Reviews Last Year's Railroad Business

While the financial position of American railroads in 1940 "remained far from satisfactory," industrial expansion in the country during the past year brought about heavier traffic, larger revenues, and improved income, Secretary of Commerce Jesse H. Jones stated on March 2.

"Although carloadings fell somewhat short of the 1937 total, the ton-miles of freight carried last year was the largest in a decade," Secretary Jones said. "Gross revenues, net operating income and net income were the highest since 1930. The downward trend in available railroad equip-

ment was halted during the year, with new equipment about offsetting retirements."

The Secretary also pointed out that in comparison with 1929, railroad operating revenues in 1940 remained nearly one-third lower, operating income was down more than 45 per cent and net income amounted to less than one-fifth of the 1929 figure. Nearly one-third of railway mileage was in receivership, and the net operating income of the past year was only about 110 per cent of fixed charges.

"Freight carloadings in 1940," he went on, "increased 7.2 per cent, surpassing the 1939 volume in every month except October. The seasonal pattern which usually gives rise to a traffic peak in October was less pronounced last year because coal shipments were not concentrated so much in the fall months as usually. Freight revenues in 1940 increased 8.8 per cent over 1939, although freight revenue per ton-mile dropped from 0.973 cents in 1939 to about 0.95 cents in 1940, the lowest rate of record with the exception of 1937. The decline reflected principally a shift in the composition of freight traffic toward lower revenue tonnage. Passenger traffic in 1940 was more than three per cent above that of 1939, but revenues were off slightly as fares in the Eastern District were reduced from 2.5 to 2 cents per mile after March 24. 'Grand circle' (coast-to-coast and return) excursion fares were continued, and special reductions were granted to uniformed personnel of the armed forces at Christmas time.

"Total operating revenues for 1940 were the highest since 1930, up 7.5 per cent from 1939, and net operating income was up 15 per cent from the previous year. Net income was 191.0 million dollars, up 97.9 millions from 1939.

"The supply of railroad equipment in 1940 remained relatively unchanged from the preceding year. The position of the railroads in this respect, however, must be viewed in the light of the decline in supply as compared to that available 10 years ago. Locomotives of all types in service in Class I railways at the end of 1940 was 28 per cent less than in 1929, and the number of steam freight locomotives was 27 per cent less, while the aggregate tractive force had declined about 20 and 18 per cent respectively."

Says Wheeler-Lea Act Will Retard Recovery of Coastwise Shipping

Representative Mansfield, Democrat of Texas, chairman of the House committee on rivers and harbors, extended his remarks in the appendix to the March 3 issue of the Congressional Record to point out how the cotton industry has been "seriously affected by collapse of coastwise shipping," and to argue that the Transportation Act of 1940 is "in way of recovery."

Generally, Mr. Mansfield undertook to make the point that while rail rates on cotton from Texas to New England have recently been reduced, the cotton producer's transportation costs are nevertheless higher because he is losing the competitive water service or facing increased rates for what remains of such service. As for the coastwise ships which the war has caused to be

sold or diverted to more profitable fields, Mr. Mansfield said: "There is probably no way of replacing them at this time, as capital will not be invested to provide new ships that cannot successfully compete with the railroads under existing law."

"Before the adoption of the Wheeler-Lea Transportation Act," Mr. Mansfield also said, "the coastwise trade had grown to enormous proportions. It is now a thing of the past unless it can be revived by additional legislation involving increased transportation rates. Of course, the purpose of that bill, by placing all transportation under the Railroad Commission, was to gain more business for the railroads. This could only be done by taking it away from ocean ships and inland waterways. These results are now being accomplished. Transportation rates are being more nearly equalized. Rail rates on competitive traffic have been temporarily reduced. Ships have gone out of commission. The total transportation cost, both by ship and by rail, has been substantially increased, and further increases are contemplated. The people, especially the cotton farmers, are left 'holding the bag.'"

"There are now only two ship lines left in operation carrying cotton in the coastwise trade from Texas—the Morgan, and the Seatrain lines—both operated in the interest of the railroads." In connection with Seatrain, Mr. Mansfield referred to an I. C. C. examiners' report on the relationship of that water carrier to the Texas & Pacific and Missouri Pacific. According to the Texan, the proposed report holds that the Transportation Act of 1940 has made changes in the Panama Canal Act. When the commission passes upon that case, Mr. Mansfield hopes that it "will not also misunderstand"; because sponsors of the act when it was before Congress "gave the most positive assurances that it did not change the Panama Canal Act in any way whatever, except to clarify it."

T. N. E. C. Study Criticizes Produce Terminals

A. C. Hoffman, principal agricultural economist of the Bureau of Agricultural Economics of the United States Department of Agriculture in Monograph No. 35, "Large Scale Organization in the Food Industries," prepared for the Temporary National Economic Committee, reaches the conclusion that savings in freight and transportation costs obtained as a result of large-scale marketing organization are probably not as great as is sometimes thought. In his study for the T. N. E. C., Mr. Hoffman goes on to assert that the most notable example of transportation waste and inefficiency in food distribution is to be found in the intricacy cartage of perishable food products.

"The wholesale produce markets of most large cities," writes Mr. Hoffman, "are antiquated, decentralized, congested and altogether inadequate for the proper handling of perishable produce. Buyers and sellers who use the markets are subject to costly delays and inconvenience. Many of the markets do not have direct rail connections, which adds to the cost of terminal cartage. The situation has been such

as to provide an opportunity for associations of truck owners and drivers to impose costly regulations and restrictions upon the free movement of produce within large cities.

"The burden of this sort of thing is not precisely ascertainable, but it undoubtedly adds a considerable amount to the cost of certain food products. Intracity cartage costs in New York City amount on the average to four to six per cent of the retail price of fresh fruits and vegetables. Conditions here are typical of those in other large cities. A considerable part of this could be saved by proper arrangement and location of the wholesale produce markets, so that it cannot be said that this source of inefficiency is necessarily inherent in the regular marketing system. Under present conditions, however, the larger grocery chains have gained a substantial advantage over other handlers by virtue of the fact that they have established their own produce warehouses and no longer rely on the terminal wholesale markets for their fruit and vegetable supplies.

"The integrated mass distributor," concludes this section of the monograph, "is also likely to have some time advantage in the handling of perishable produce. For example, chain-store systems which receive fruits and vegetables direct at their warehouses almost invariably get the produce into their retail units from 12 to 24 hours sooner than do handlers in the regular channels. With a highly perishable commodity, these few hours may prevent a great deal of wastage and spoilage."

House Gets Lea Forwarder Bill

(Continued from page 431)

Act. Under it the forwarders (except in the performance within terminal areas of transfer, collection, or delivery services) would be limited to the utilization of regulated common carriers by rail, motor vehicle or water; and they would be permitted to establish joint rates with such common carriers. Divisions in connection with the joint rates would be under the jurisdiction of the commission and would be filed in "notices of divisions," which "may, in the discretion of the commission, be made available for inspection to any freight forwarder or common carrier by railroad, motor vehicle, or water, subject to this Act, but shall not be made available for inspection to any other person." The division to be received by any participating carrier would have to be lower than the corresponding local rate of such carrier.

The bill contains a minimum-rate rule, which, as Mr. Lea's statement put it, "makes it unlawful for a freight forwarder to maintain a rate, with respect to any transportation which it undertakes, which is lower than the lowest contemporaneous rate in effect with respect to transportation of like kind and quantity of property between the same points by common carriers by railroad, motor vehicle, and water, subject to the Interstate Commerce Act." The purpose "claimed for this provision," Mr. Lea added, "is to prevent destructive rate

wars which might result from freight forwarders' rates being lower than the regular published rates of the carriers whose services they utilize." Nevertheless, there is a provision authorizing the commission to grant forwarders relief from the minimum-rate rule "in special cases" upon a finding that there is no competitive common-carrier service on the route involved; or that the "principal competitive transportation" is performed other than by a common carrier subject to the Act.

The bill's "grandfather clause" is a sort of double-jointed affair; the "grandfather" date with respect to engaging in operations being July 20, 1937, while that covering "the use of key points" is January 8, 1941. The "key points" are places where forwarders consolidate shipments into carloads or break up carloads for distribution of shipments to final destination. Forwarders without "grandfather" rights would be required to obtain certificates of convenience and necessity from the commission. Also, there is a "commodities clause" making it unlawful after January 1, 1942, for a shipper to engage in forwarder operations or to own or control a freight forwarder. Exempt from the bill's provisions would be forwarders controlled by agricultural cooperatives, and forwarding operations where the property transported consists of ordinary livestock, fish, agricultural commodities, or used household goods—"if the freight forwarder does not engage in forwarding operations with respect to any other property."

Provisions relating to unifications, mergers, and acquisitions of control would make it unlawful for a forwarder to acquire control of any carrier subject to Parts I, II, or III of the act; but other carriers could be authorized by the I. C. C. to acquire forwarders. Carriers now controlling forwarders would have 180 days after the effective date of the acquisition provisions to file an application for authority to continue the arrangement. If the commission's decision is adverse, the arrangement may still continue "until such reasonable time after such determination as the commission, in its order, shall specify." The merger provisions have a "labor-protection" clause authorizing the commission to condition its approval of any transaction upon the inclusion of "a fair and equitable arrangement to protect the interests of the employees affected."

Generally speaking the bill's other provisions covering such matters as rates, tariffs, accounts, collection of charges, allowances to shippers, the rate-making rule and unlawful acts and penalties follow the pattern of the Motor Carrier Act. Also, there is a provision giving the commission authority in time of emergency to enforce priorities with respect to freight moved by forwarders. The act would become effective as of the date of enactment except the rate, tariff, and divisions provisions and related sections; also, the section relating to the carriers whose services the forwarders may utilize. These would be effective 90 days after enactment; and the commission would get authority to postpone up to July 1, 1942, the effective date of any provision.

The Senate committee has taken no action as yet on the aforementioned Wheeler-

Reed bill, which was reviewed in the *Railway Age* of January 11, page 147. As there noted, that bill would deny forwarders the status of common carriers under the Interstate Commerce Act, while giving the I. C. C. authority to regulate them in their relationships with their customers and with the carriers whose services they utilize. Also, the Senate bill would forbid joint-rate arrangements between forwarders and the utilized carriers. When his bill was introduced, Senator Reed did not think that public hearings would be necessary—in view of last session's extensive hearings on previous forwarder bills, and on Senate Resolution 146 which called for the Senate interstate commerce committee's investigation of railroad methods of handling l.c.l., forwarder and express traffic.

January Truck Volume 9.8 Per Cent Over 1940

The volume of freight transported by motor truck in January represented an increase of 2.4 per cent over December, and an increase of 9.8 per cent above the volume carried in January, 1940, according to American Trucking Associations, Inc.

Comparable reports were received by A. T. A. from 210 motor carriers in 34 states. The reporting carriers transported an aggregate of 1,306,940 tons in January, as against 1,276,425 tons in December and 1,190,474 tons in January, 1940. The A. T. A. index figure, computed on the basis of the 1938, 1939 and 1940 monthly average tonnage of the reporting carriers as 100, stood at 131.27 for January. In the past, the index figure has been based upon the 1936 monthly average of the reporting carriers. The statement says that "this basis, however, no longer was considered satisfactory for comparing relative increases or decreases in loadings because of the fact that in the period since 1936 there have been numerous mergers and consolidations among motor carriers. Comparison of the tonnage now hauled by a carrier that has purchased new operations with the tonnage hauled by the same carrier in 1936 prior to acquisition of the new operations resulted in an abnormal increase and did not give a true picture of the trend. Such inaccuracies are expected to be eliminated largely by basing the index figure upon a longer and more recent period."

Almost 80 per cent of all the freight transported in the month was reported by carriers of "general freight." The volume of freight in this category increased 4.2 per cent over December, and 10.9 per cent over January of the previous year. Transporters of petroleum products, accounting for slightly more than nine per cent of the total tonnage reported, showed a decrease of 5.7 per cent in January, as compared with December, but their volume increased 3.5 per cent over January, 1940. Movement of new automobiles and trucks, constituting a little more than four per cent of the total tonnage, decreased 7.8 per cent under December, but increased 9.8 per cent over January, 1940. Haulers of iron and steel products reported about four per cent of the total tonnage. The volume of these commodities showed a very slight de-

crease of 0.2 per cent in January as compared with December, but it represented an increase of 12.7 per cent over January of last year. A little more than three per cent of the total tonnage reported was miscellaneous commodities, including tobacco, textile products, bottles, building materials, coal, cement and household goods. Tonnage in this class increased 2.4 per cent over December, and held 9.8 per cent over the volume hauled in January, 1940.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

- ALLIED RAILWAY SUPPLY ASSOCIATION.**—J. F. Gettrust, P. O. Box 5522, Chicago, Ill.
- AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.**—W. R. Curtis, F. T. R. M. & O. R. R., 327 S. La Salle St., Chicago, Ill.
- AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.**—E. P. Soebbing, 1431 Railway Exchange Bldg., St. Louis, Mo. Annual meeting, October 21-23, 1941, San Francisco, Cal.
- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.**—B. D. Branch, C. R. R. of N. J., 143 Liberty St., New York, N. Y.
- AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.**—F. O. Whiteman, Room 332, Dearborn Station, Chicago, Ill. Annual meeting, June 3-5, 1941, Hotel Stevens, Chicago, Ill.
- AMERICAN ASSOCIATION OF RAILWAY ADVERTISING AGENTS.**—E. A. Abbott, Poole Bros., Inc., 85 W. Harrison St., Chicago, Ill. Annual meeting, January 16-17, 1942, St. Louis, Mo.
- AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.**—F. R. Borger, C. I. & L. Ry., 836 S. Federal St., Chicago, Ill.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.**—F. O. Whiteman, Room 332, Dearborn Station, Chicago, Ill. Annual meeting, October 14-16, 1941, Hotel Stevens, Chicago, Ill.
- AMERICAN RAILWAY CAR INSTITUTE.**—W. C. Tabbert, 19 Rector St., New York, N. Y.
- AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.**—G. E. Smith, New York Central R. R., La Salle Street Station, Chicago, Ill.
- AMERICAN RAILWAY ENGINEERING ASSOCIATION.**—Works in cooperation with the Association of American Railroads, Engineering Division.—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 11-13, 1941, Palmer House, Chicago, Ill.
- AMERICAN RAILWAY MAGAZINE EDITORS' ASSOCIATION.**—M. W. Jones, Baltimore & Ohio R. R., 1105 B. & O. R. R. Bldg., Baltimore, Md.
- AMERICAN SHORT LINE RAILROAD ASSOCIATION.**—J. H. Hunt, Tower Bldg., Washington, D. C.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.**—C. E. Davies, 29 W. 39th St., New York, N. Y. Spring meeting, March 31-April 3, 1941, Hotel Biltmore, Atlanta, Ga.
- RAILROAD DIVISION, C. L. Combes, Railway Age, 30 Church St., New York, N. Y.**
- AMERICAN TRANSIT ASSOCIATION.**—Guy C. Hecker, 292 Madison Ave., New York, N. Y.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.**—H. L. Dawson, 1427 Eye St., N. W., Washington, D. C. Annual meeting, January 27-29, 1942, Nicollet Hotel, Minneapolis, Minn.
- ASSOCIATION OF AMERICAN RAILROADS.**—H. J. Forster, Transportation Bldg., Washington, D. C.
- Operations and Maintenance Department.**—Charles H. Buford, Vice-President, Transportation Bldg., Washington, D. C.
- Operating-Transportation Division.**—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.
- Operating Section.**—J. C. Caviston, 30 Vesey St., New York, N. Y.
- Transportation Section.**—L. R. Knott, 59 E. Van Buren St., Chicago, Ill.
- Fire Protection and Insurance Section.**—W. F. Steffens, New York Central, Room 3317, 230 Park Avenue, New York, N. Y. Annual meeting, October 14-15, 1941, Chicago, Ill.
- Freight Station Section.**—L. R. Knott, 59 E. Van Buren St., Chicago, Ill. Annual meeting, June 17-19, 1941, Statler Hotel, St. Louis, Mo.
- Medical and Surgical Section.**—J. C. Caviston, 30 Vesey St., New York, N. Y. Annual meeting, June 2-3, 1941, Hotel Cleveland, Cleveland, O.
- Protective Section.**—J. C. Caviston, 30 Vesey St., New York, N. Y. Annual meeting, June 24-26, 1941, Shirley-Savoy Hotel, Denver, Colo.
- Safety Section.**—J. C. Caviston, 30 Vesey St., New York, N. Y. Annual meeting, April 8-10, 1941, Roosevelt Hotel, New Orleans, La.
- Telegraph and Telephone Section.**—W. A. Fairbanks, 30 Vesey St., New York, N. Y.
- Engineering Division.**—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 11-13, 1941, Palmer House, Chicago, Ill.
- Construction and Maintenance Section.**—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, March 11-13, 1941, Palmer House, Chicago, Ill.
- Electrical Section.**—W. S. Lacher, 59 E. Van Buren St., Chicago, Ill.
- Signal Section.**—R. H. C. Balliet, 30 Vesey St., New York, N. Y. Annual meeting, September 30-October 2, 1941, Broadmoor Hotel, Colorado Springs, Colo.
- Mechanical Division.**—Arthur C. Brown, 59 E. Van Buren St., Chicago, Ill. Annual meeting June 19-20, 1941, Hotel Jefferson, St. Louis, Mo.
- Electrical Section.**—J. A. Andreucetti, 59 E. Van Buren St., Chicago, Ill.
- Purchases and Stores Division.**—W. J. Farrell, 30 Vesey St., New York, N. Y.
- Freight Claim Division.**—Lewis Pilcher, 59 E. Van Buren St., Chicago, Ill. Annual meeting, June 10-12, 1941, Denver, Colo.
- Motor Transport Division.**—George M. Campbell, Transportation Bldg., Washington, D. C.
- Car-Service Division.**—E. W. Coughlin, Transportation Bldg., Washington, D. C.
- Finance, Accounting, Taxation and Valuation Department.**—E. H. Bunnell, Vice-President, Transportation Bldg., Washington, D. C.
- Accounting Division.**—E. R. Ford, Transportation Bldg., Washington, D. C. Annual meeting June 24-26, 1941, Cosmopolitan Hotel, Denver, Colo.
- Treasury Division.**—E. R. Ford, Transportation Bldg., Washington, D. C. Annual meeting June 24-26, 1941, Broadmoor Hotel, Colorado Springs, Colo.
- Traffic Department.**—A. F. Cleveland, Vice-President, Transportation Bldg., Washington, D. C.
- ASSOCIATION OF RAILWAY CLAIM AGENTS.**—F. L. Johnson, Claim Agent, Alton R. R., 340 W. Harrison St., Chicago, Ill. Annual meeting, June 11-13, 1941, Browne Palace Hotel, Denver, Colo.
- BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.**—R. Y. Barham, Armco Railroad Sales Company, 310 S. Michigan Ave., Chicago, Ill. Meets with American Railway Bridge and Building Association.
- CANADIAN RAILWAY CLUB.**—C. R. Crook, 4415 Marcell Ave., N. D. G., Montreal, Que. Regular meetings, second Monday of each month except June, July and August, Windsor Hotel, Montreal, Que.
- CAR DEPARTMENT ASSOCIATION OF ST. LOUIS, MO.**—J. J. Sheehan, 1101 Missouri Pacific Bldg., St. Louis, Mo. Regular meetings, third Tuesday of each month, except June, July and August, Hotel De Soto, St. Louis, Mo.
- CAR DEPARTMENT OFFICERS' ASSOCIATION.**—Frank Kartheiser, Chief Clerk, Mechanical Dept., C. B. & Q., Chicago, Ill. Annual meeting September 22-24, 1941.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.**—G. K. Oliver, 8238 S. Campbell Ave., Chicago, Ill. Regular meetings, second Monday of each month, except June, July and August, La Salle Hotel, Chicago, Ill.
- CENTRAL RAILWAY CLUB OF BUFFALO.**—Mrs. M. D. Reed, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, second Thursday of each month, except June, July and August, Hotel Statler, Buffalo, N. Y.
- EASTERN ASSOCIATION OF CAR SERVICE OFFICERS.**—J. T. Bougher, 424 W. 33rd St. (11th floor), New York, N. Y.
- LOCOMOTIVE MAINTENANCE OFFICERS' ASSOCIATION.**—J. E. Goodwin, Gen. Foreman, Loco. Dept., Missouri Pacific R. R., No. Little Rock, (P. O. Little Rock), Ark. Annual meeting, September 22-24, 1941.
- MASTER BOILER MAKERS' ASSOCIATION.**—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y. Annual meeting, September 23-24, 1941, Hotel Sherman, Chicago, Ill.
- NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.**—Ben Smart, 7413 New Post Office Bldg., Washington, D. C. Annual meeting, 1941, St. Paul, Minn.
- NATIONAL RAILWAY APPLIANCE ASSOCIATION.**—C. H. White, Room 1826, 208 S. La Salle St., Chicago, Ill. Exhibit in connection with A. R. E. A. Convention, March 10-13, 1941, International Amphitheatre, Chicago, Ill.
- NEW ENGLAND RAILROAD CLUB.**—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, second Tuesday of each month, except June, July, August and September, Hotel Touraine, Boston, Mass.
- NEW YORK RAILROAD CLUB.**—D. W. Pye, 30 Church St., New York, N. Y. Regular meetings, third Thursday of each month, except June, July, August, September, and December, 29 W. 39th St., New York, N. Y.
- PACIFIC RAILWAY CLUB.**—William S. Wollner, P. O. Box 3275, San Francisco, Cal. Regular meetings, second Thursday of each alternate month, at Palace Hotel, San Francisco, and second Friday of each alternate month, at Hotel Hayward, Los Angeles.
- RAILWAY BUSINESS ASSOCIATION.**—P. H. Middleton, First National Bank Bldg., Chicago, Ill.
- RAILWAY CLUB OF PITTSBURGH.**—J. D. Conway, 1647 Oliver Bldg., Pittsburgh, Pa. Regular meetings, fourth Thursday of each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.
- RAILWAY ELECTRIC SUPPLY MANUFACTURERS' ASSOCIATION.**—J. McC. Price, Allen-Bradley Company, 600 W. Jackson Blvd., Chicago, Ill.
- RAILWAY FUEL AND TRAVELING ENGINEERS' ASSOCIATION.**—T. Duff Smith, Room 811, Utilities Bldg., 327 S. La Salle St., Chicago, Ill. Annual meeting, September 22-24, 1941.
- RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.**—J. D. Conway, 1647 Oliver Bldg., Pittsburgh, Pa.
- RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.**—G. A. Nelson Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with Telegraph and Telephone Section of A. A. R.
- RAILWAY TIE ASSOCIATION.**—Roy M. Edmonds, 903 Syndicate Trust Bldg., St. Louis, Mo. Annual meeting, May 21-22, 1941, Arlington Hotel, Hot Springs, Ark.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.**—F. O. Whiteman, Room 332, Dearborn Station, Chicago, Ill. Annual meeting, September 16-18, 1941, Hotel Stevens, Chicago, Ill.
- SIGNAL APPLIANCE ASSOCIATION.**—G. A. Nelson, Waterbury Battery Company, 30 Church St., New York, N. Y. Meets with A. A. R. Signal Section.
- SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.**—A. T. Miller, 4 Hunter St., S. E., Atlanta, Ga. Regular meetings, third Thursday in January, March, May, July, September and November, Ansley Hotel, Atlanta, Ga.
- SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.**—D. W. Brantley, C. of Ga. Ry., Savannah, Ga.
- TORONTO RAILWAY CLUB.**—D. M. George, P. O. Box 8, Terminal "A," Toronto, Ont. Regular meetings, fourth Monday of each month, except June, July and August, Royal York Hotel, Toronto, Ont.
- TRACK SUPPLY ASSOCIATION.**—Lewis Thomas, Q. and C. Company, 59 E. Van Buren St., Chicago, Ill.
- UNITED ASSOCIATIONS OF RAILROAD VETERANS.**—Roy E. Collins, 112 Hatfield Place, Port Richmond, Staten Island, N. Y. Annual meeting, October 11-12, 1941, Cleveland, Ohio.
- WESTERN RAILWAY CLUB.**—W. L. Fox (Executive Secretary), Room 822, 310 S. Michigan Ave., Chicago, Ill. Regular meetings, third Monday of each month, except June, July, August and September, Hotel Sherman, Chicago, Ill.

Construction

ATCHISON, TOPEKA & SANTA FE.—A contract has been awarded George Senne & Co., Topeka, Kan., for the construction of a car repair shed at West Wichita, Kan. The building will be 44 ft. wide by 450 ft. long and will have a structural steel frame, corrugated iron sides, and a wooden sheathing and composition roof. The building will span two tracks and will be used for repairing freight cars. The total cost of the project, including track changes, will be approximately \$120,000. A contract for the plumbing and heating work was awarded the R. P. Johnson Plumbing & Heating Co., at Wichita.

DELAWARE & HUDSON.—Contract has been awarded to the American Bridge Company, New York City for construction work in connection with two bridge renewals at Ft. Edward, N. Y., at estimated cost of \$285,770.

Equipment and Supplies

Heavy Equipment Buying Continues

Totals of 127 locos.: 5,645 freight and 45 pass. cars ordered in Feb.

The current uptrend in railroad equipment buying that began in June, 1940, continued during the month of February, 1941. Locomotive orders, which in January exceeded the average of 73 locomotives per month placed during the last six months of 1940, gained further momentum in February, to give the first two months of 1941 the largest volume of locomotive orders placed during that period of any year in the 1929-1941 cycle, which is the current basis of *Railway Age* equipment buying comparisons.

Railway equipment purchases for domestic service reported in the *Railway Age* during February totaled 127 locomotives, 5,645 freight cars and 45 passenger-train cars. Of the 127 locomotives ordered, 44 were steam, 78 Diesel-electric, gas-electric or other internal-combustion types and 5 electric.

Locomotive Orders Compared

	February 1941	January 1941	February 1940
Locomotives:			
Steam	44	24	..
Diesel-electric, etc.	78	49	13
Electric	5	5	..
Total locos.	127	78	13
Freight cars	5,645	14,118	2,748
Passenger cars	45	130	20

Railway Age totals as used in these comparisons include railway equipment ordered by the railroads, government departments and industrial companies. A division of the 127 locomotives ordered in February by these classifications, further separated according to steam, Diesel-electric, etc., and electric locomotives follows:

	Steam	D. E., etc.	Elec.	Total
R. R. Cos.	40	42	5	87
Ind. Cos.	4	4	..	8
U. S. Gov't.	..	32	..	32
	44	78	5	127

The largest volume of locomotive orders previously booked during the month of February in the 1929-1941 cycle was 73 ordered in February, 1929. It will be noted that not only do the 127 ordered last month far exceed this figure, but the 87 locomotives purchased by the railroads alone represent a substantial increase. Indeed, in only three months since January, 1930, has a larger number of orders been reported. Increased by substantial United States army and navy purchases, the 78 Diesel-electric locomotives ordered is exceeded in the history of this equipment only by the 90 ordered in July, 1940. As previously noted, the 205 locomotives purchased in the first two months of this year, 68 steam, 127 Diesel-electric or other internal-combustion types and 10 electric, represents the largest volume of locomotive orders placed dur-

ing that period of any year since 1929 and is an increase of 142 locomotives over the corresponding two months of last year i. e., 45 steam, 87 Diesel-electric and 10 electric.

Large steam locomotive purchases reported in February included twenty-five 4-8-4 type ordered for the Grand Trunk Western, eight 4-6-4 type by the Chesapeake & Ohio and four 2-8-2 type by the Detroit, Toledo & Ironton. Orders for Diesel-electric, gas-electric and other internal-combustion types included 15 switching units of 600 or 660 hp. by the Southern Pacific, ten 660 hp. switching units by the New York, New Haven & Hartford, seven 1,000 hp. units by the Northern Pacific, five 44-ton units by the Chicago, Rock Island & Pacific and thirty-two units by the United States War and Navy departments. The five electric freight locomotives were

ordered by the New York, New Haven & Hartford.

While the 5,645 freight cars ordered in February was below the average of 8,108 cars per month ordered during the last six months of 1940, this was no doubt due in large measure to the large volume of 14,118 cars placed in the preceding month, and it will be noted that last month's orders are nevertheless more than double the number of cars ordered in February, 1940. February orders chiefly comprised 2,353 box cars of various types, 1,480 hopper cars and 1,410 gondola cars. Of the total, 1,707 cars and 100 cabooses were placed with the carrier's own shops and 3,938 with builders. Leading purchases included 700 cars by the Chicago & North Western, 600 by the Grand Trunk Western, 506 cars and 25 cabooses by the Chicago, Mil-

Domestic Equipment Orders Reported In Issues Of The Railway Age In February 1941 (Including March 1)

LOCOMOTIVES

Date	Name of Company	No.	Type	Builder
Feb. 8	Detroit, Toledo & Ironton	4	2-8-2	Lima Locomotive Works
Feb. 8	Southern Pacific	5	Diesel-electric Sw.	American Locomotive Co.
		2	Diesel-electric Sw.	Baldwin Locomotive Works
		8	Diesel-electric Sw.	Electro-Motive Corp.
Feb. 8	Northern Pacific	2	Diesel-electric	American Locomotive Co.
		2	Diesel-electric	Baldwin Locomotive Works
		3	Diesel-electric	Electro-Motive Corp.
Feb. 15	Chesapeake & Ohio	8	4-6-4	Baldwin Locomotive Works
Feb. 15	Maine Central	1	Diesel-electric Sw.	American Locomotive Co.
		1	Diesel-electric Sw.	General Electric Co.
Feb. 15	New York, New Haven & Hartford	5	Electric Freight	West. Elec. & Mfg. Co.
Feb. 22	Panama Railroad	3	Oil-Steam	H. K. Porter Co.
Feb. 22	New York, New Haven & Hartford	10	Diesel-electric Sw.	American Locomotive Co.
Feb. 22	U. S. Navy Dept.	4	Diesel-mechanical	Vulcan Iron Works
Feb. 22	Connecticut Light & Power Co.	1	0-4-0 Fireless	Heislner Locomotive Works
Feb. 22	Norton Company	1	0-6-0 Fireless	Heislner Locomotive Works
Feb. 22	American Brass Co.	1	0-4-0 Fireless	Heislner Locomotive Works
Mar. 1	Grand Trunk Western	25	4-8-4 Freight	American Locomotive Co.
Mar. 1	New York Shipbuilding Co.	1	0-4-0	Vulcan Iron Works
Mar. 1	Lone Star Cement Corp.	2	Diesel-mechanical	Vulcan Iron Works
Mar. 1	DuPont de Nemours Co., E. I.	2	Diesel-electric	Vulcan Iron Works
Mar. 1	U. S. Navy Dept.	6	Diesel-electric	Vulcan Iron Works
Mar. 1	Chicago, Rock Island & Pacific	5	Diesel-electric	Davenport-Besler Corp.
Mar. 1	U. S. War Dept.	5	Diesel-electric	Davenport-Besler Corp.
		2	Diesel-mechanical	Davenport-Besler Corp.
		15	Gasoline-mechanical	Davenport-Besler Corp.
Mar. 1	Atchison, Topeka & Santa Fe	2	Diesel-electric Freight	Electro-Motive Corp.
		1	Diesel-electric Pass.	Electro-Motive Corp.

FREIGHT CARS

Feb. 8	Chicago & North Western	200	Ore	Bethlehem Steel Co.
		500	Box	Pullman-Standard
Feb. 8	Bethlehem Steel Co.	100	Gondola	Company Shops
Feb. 15	Bessemer & Lake Erie	5	Hopper	Pullman-Standard
Feb. 15	Chicago, Rock Island & Pacific	25	Caboose	Company Shops
Feb. 15	Grand Trunk Western	200	Gondola	Magor Car Corp.
		100	Flat	Greenville Steel Car
		300	Auto	Pressed Steel Car
Feb. 15	McKeesport Connecting	100	L. S. Gondola	American Car & Foundry
Feb. 15	St. Louis Refrigerator	35	Refrigerator	Company Shops
Feb. 15	U. S. Navy Dept.	33	Box	Greenville Steel Car
Feb. 15	U. S. War Dept.	20	Box	Greenville Steel Car
Feb. 22	Utah Copper Co.	75	Ore	Pressed Steel Car
Feb. 22	Bethlehem Steel Co.	2	Ingot Transfer	Company Shops
Feb. 22	Lake Superior & Ishpeming	100	Ore	Bethlehem Steel Co.
Feb. 22	Chesapeake & Ohio	25	Flat	Ralston Steel Car
		10	Flat	Greenville Steel Car
		10	Well	Greenville Steel Car
Feb. 22	Minneapolis, St. Paul & Sault St. Marie	100	Flat	Pullman-Standard
		50	Rodger Ballast	American Car & Foundry
Mar. 1	Chicago, Milwaukee, St. Paul & Pacific	6	Flat	Company Shops
		25	Caboose	Company Shops
		500	Box	Company Shops
Mar. 1	Bethlehem Steel Co.	14	Flat	Company Shops
Mar. 1	John Roebling's Sons Co.	10	Gondola	American Car & Foundry
Mar. 1	Baltimore & Ohio	500	Gondola	American Car & Foundry
		500	Gondola	Bethlehem Steel Co.
Mar. 1	Central of New Jersey	1,000	Hopper	Company Shops
		50	Cement	Company Shops
		50	Caboose	Company Shops
Mar. 1	New York, New Haven & Hartford	1,000	Box	Pressed Steel Car

PASSENGER TRAIN CARS

Mar. 1	Chicago, Milwaukee, St. Paul & Pacific	20	.....	Company Shops
Mar. 1	Chicago & North Western	3	Bag-Taproom-Lounge	Pullman-Standard
		14	Coach	Pullman-Standard
		4	Diner	Pullman-Standard
		4	Parlor	Pullman-Standard

waukee, St. Paul & Pacific, 1,000 cars by the Baltimore & Ohio, 1,050 cars and 50 cabooses by the Central of New Jersey and 1,000 cars by the New York, New Haven & Hartford.

The volume of freight car orders placed so far this year now totals 19,763 units and raises freight purchases for the nine months ended February 28, during which period the current uptrend in freight car buying has been in effect, to over 75,000 cars. The 19,763 cars purchased during first two months of this year were divided as follows:

- 8,948 box
- 5,195 gondola
- 3,200 hopper
- 1,035 refrigerator
- 737 flat
- 300 stock
- 340 caboose
- 8 miscellaneous

The 45 passenger-train cars ordered in February comprise 20 to be built in company shops by the Chicago, Milwaukee, St. Paul & Pacific and 25 placed by the Chicago & North Western. This raises total passenger-train cars purchased so far this year to 175, only 109 cars under the total number placed during the whole of last year, and together with substantial unfilled orders now outstanding, seems to assure a substantially larger volume of orders for this type of equipment this year.

LOCOMOTIVES

THE CINCINNATI, NEW ORLEANS & TEXAS PACIFIC has placed an order for two 5,400 hp. Diesel-electric freight locomotives with the Electro-Motive Corporation.

THE CHICAGO & NORTH WESTERN has ordered five 2,000 h. p. Diesel-electric passenger locomotives, placing four with the Electro-Motive Corporation and one with the American Locomotive Company.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC is contemplating the purchase of at least one Diesel-electric main-line freight locomotive for use in Idaho and Washington.

THE CHICAGO, BURLINGTON & QUINCY was incorrectly reported in the *Railway Age* of March 1 as having ordered five 44-ton Diesel-electric locomotives from the Davenport Besler Corporation. This order was placed by the Chicago, Rock Island & Pacific as noted elsewhere in this column.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered five 44-ton Diesel-electric locomotives from the Davenport Besler Corporation. This order was incorrectly reported last week as having been placed by the Chicago, Burlington & Quincy and is included correctly in the summary of equipment orders placed in February presented elsewhere in this column.

FREIGHT CARS

THE PERE MARQUETTE has ordered 500 freight cars, placing 100 steel box cars of 50 tons' capacity each with the Pullman-Standard Car Manufacturing Company, American Car & Foundry Co., General American Transportation Corporation and Greenville Steel Car Company, and 100

40-ton automobile cars with the Ralston Steel Car Co.

THE DENVER & RIO GRANDE WESTERN has ordered ten cabooses from the Bethlehem Steel Company.

THE LEHIGH & NEW ENGLAND is inquiring for 100 covered hopper cars of 10 tons' capacity.

THE PHELPS DODGE CORPORATION is in the market for 80 air-dump cars of 90 tons' capacity.

THE AMERICAN REFRIGERATOR TRANSIT COMPANY has ordered 150 refrigerator cars of 40 tons' capacity from company's St. Louis, Mo., shops.

PASSENGER CARS

THE CHESAPEAKE & OHIO has placed an order for 20 standard, all-steel passenger coaches with the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of February 1.

THE NORFOLK & WESTERN has ordered 15 passenger coaches from the Pullman-Standard Car Manufacturing Company. Inquiry for this equipment was reported in the *Railway Age* of February 8.

SIGNALING

THE WHEELING & LAKE ERIE has placed an order with the Union Switch & Signal Co. covering the necessary material for rebuilding the mechanical interlocking plant located at its crossing with the River Terminal Railway at East 49th street, Cleveland, Ohio. The new interlocking layout involves color light dwarf signals with electrically "locked, hand" throw switch layouts and will be arranged for semi-automatic operation, with the railway company carrying out the field installation work with its regular signal forces.

MOTOR VEHICLES

THE RAILWAY EXPRESS AGENCY has authorized expenditures totaling over \$4,000,000 for new automotive equipment in connection with a broad program of replacement and additions to the company's automotive facilities made necessary, in part, by increased business for national defense industries. Orders have been placed for 2,667 trucks, tractors and trailers of specified design and capacities for delivery this year.

* * * *

These Pineapples are Being Loaded for Destinations in the United States at Isla, Vera Cruz, Mexico, on the N. de M.



Photo by C. E. Carberry

Supply Trade

Fairbanks, Morse & Company Annual Report

The annual report of Fairbanks, Morse & Company for 1940 shows net profit for the year of \$2,749,698, the largest profit earned by the company since 1925. This amounts to \$4.59 a share and compares with \$2,469,884 or \$4.12 a share in 1939. Net sales for 1940 amounted to \$29,590,947, compared with \$24,489,629 in 1939. Taxes, exclusive of sales taxes, amounted to \$3,354,045 or \$5.59 a share, compared with \$1,167,633 or \$1.95 a share in 1939. During the year \$1,247,000 of outstanding 4 per cent debentures were retired.

Roy P. Williamson has been appointed sales manager of the jack division of the Buda Company of Harvey, Ill.

J. G. Blunt, formerly chief mechanical engineer, has been appointed assistant to the vice-president in charge of engineering of the American Locomotive Company. Sherman Miller has been appointed chief mechanical engineer to succeed Mr. Blunt.

Howard P. DeVilbiss and Roy A. Guyer have been elected vice-presidents of the DeVilbiss Company, Toledo, Ohio. Mr. DeVilbiss, son of the founder, has been active in the company since his father's death in 1928 and Mr. Guyer has been sales manager of the spray painting division.

P. A. Pounds has been appointed vice-president and assistant general manager; E. B. Christensen, secretary and treasurer, and David J. Miller, sales manager of the Paxton-Mitchell Company, Omaha, Neb. Mr. Pounds joined the company in 1916, coming from the store department of the Southern Pacific at Sacramento, Cal. He became secretary and treasurer in 1920, which position he held until his current appointment. Mr. Christensen joined the company in 1922 and was placed in charge of railroad sales and service engineers in 1925. In 1937 he was appointed assistant secretary and treasurer, which position he held until his current appointment. Mr. Miller joined the company in 1928 in the accounting department. In 1939 he was transferred to the sales department in charge of local sales and held this position until his recent appointment.

Financial

AKRON, CANTON & YOUNGSTOWN.—Merger.—A plan to reorganize the Akron, Canton & Youngstown and the Northern Ohio into one company, as approved by the federal district court at Cleveland, Ohio, has been upheld by the United States circuit court of appeals at Cincinnati. Appeal from the district court's action had been taken by the A. C. & Y. on the ground that the program would give the New York, Chicago & St. Louis the status of a general creditor with a contingent claim of \$3,000,000. This amount represents a guarantee of bonds issued by the Northern Ohio.

CHERAW & WESTERN.—Acquisition.—This newly-organized company has asked the Interstate Commerce Commission for authority to acquire the properties of the Chesterfield & Lancaster, extending from Cheraw, S. C., to Pageland, 31.8 miles. The petition states that the purchase price will be \$40,400.

CHICAGO & NORTH WESTERN.—Equipment Trust Certificates.—This company has been authorized by Division 4 of the Interstate Commerce Commission to assume liability for \$5,400,000 of 1½ per cent equipment trust certificates, maturing in 10 equal annual installments of \$540,000 on March 1 in each of the years from 1942 to 1951, inclusive. The issue has been sold at 100.2387 to Laurence M. Marks & Co. and Drexel & Co., making the average annual cost to the company approximately 1.83 per cent.

CINCINNATI UNION TERMINAL.—Bonds.—This company has asked the Interstate Commerce Commission for authority to issue \$3,000,000 of first mortgage bonds, series F, to bear interest at not more than three per cent and to mature March 1, 1971, the proceeds to be used to redeem on July 1, 1941, all of its outstanding 30,000 shares of five per cent preferred stock of a par value of \$100 a share. The petition points out that by redeeming the stock at \$105 per share the company will save \$106,780 over the life of the bonds on income tax, capital stock tax, and dividend payments.

The proprietary companies of the terminal, each of which own one-seventh of its stock, have asked the commission for authority to guarantee the payment of the principal and interest of the bonds. They are the Baltimore & Ohio, Chesapeake & Ohio, Southern, New York Central (Cleveland, Cincinnati, Chicago & St. Louis), Louisville & Nashville, Norfolk & Western, and Pennsylvania.

FONDA, JOHNSTOWN & GLOVERSVILLE.—Reorganization Plan.—The equities of the holders of the present preferred stock, common stock, and the general creditors would be found to have no value and the capitalization of this company would be reduced from \$9,184,273 to \$2,400,305, if Division 4 of the Interstate Commerce Commission adopts a proposed reorganization plan for this company under section 77 which has been prepared by Examiner Roy A. Porterfield. The new plan, which

would become effective as of January 1, 1941, would also reduce the fixed interest charges from \$148,663 to \$24,780 with the entire elimination of rent for the Johnstown, Gloversville & Kingsboro Horse amounting to \$4,480 on its outstanding securities.

The proposed plan also provides that the present holders of general refunding bonds would receive, for their claims principal and interest to January 1, 1941, 40 per cent in new first mortgage, series B, four per cent bonds and 60 per cent in new 4½ per cent income bonds. The present holders of first consolidated general refunding bonds would receive \$10 in cash for each interest coupon maturing either November 1, 1931 or May 1, 1932 (on which \$10 interest had not been paid prior to the reorganization proceedings), and in addition for each \$1,000 bond and interest coupons subsequent to May 1, 1932, would receive \$21.30 in four per cent, five-year equipment notes, \$50 in new 4½ per cent income bonds, and two shares of no-par common stock.

The holders of the Johnstown, Gloversville & Kingsboro securities would be offered equal principal amount of new 4½ per cent income bonds for their present bonds and 50 per cent in new 4½ per cent income bonds and 50 per cent in no-par common stock (taking stock at \$100 a share) for the par amount of their present stock.

COLORADO & SOUTHERN.—Abandonment.—This company would be permitted to abandon its clear Creek lines, extending from Golden, Colo., to Idaho Springs, 21.8 miles, and from Forks Creek, Colo., to Black Hawk, 7.8 miles, if Division 4 of the Interstate Commerce Commission adopts a proposed report of its Examiner Ralph R. Molster. This application is a renewal of a previous one which was denied by the commission on November 5, 1938.

ERIE.—Reorganization.—A committee to handle reorganization of the Erie after the federal court declares its reorganization plan effective has been appointed as follows: Chairman, H. S. Sturgis, vice-president, First National Bank, New York; H. C. Hagerty, treasurer, Metropolitan Life Insurance Company; John Stedman, vice-president, Prudential Insurance Company; J. K. Thompson, vice-president (financial), Erie; and F. C. Wright, a representative of the Reconstruction Finance Corporation.

ILLINOIS CENTRAL.—Abandonment by the Yazoo & Mississippi Valley.—The Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, and the Brotherhood of Railroad Trainmen have filed a petition in Finance Docket No. 12548, asking the Interstate Commerce Commission to retain jurisdiction of the authorized abandonment between Greenville, Miss., and Riverside Junction until such a time as its authority over labor protection matters in abandonment cases is determined by the federal district court in Washington in the pending Pacific Electric case. (This case was brought by the Railway Labor Executives Association and seeks to ascertain what powers the commission has over labor protection matters in abandonment cases. It

involves a considerable amount of mileage to be abandoned by the Pacific Electric in and around Los Angeles, Calif.)

ILLINOIS TERMINAL.—Equipment Trust Certificates.—This company has been authorized by Division 4 of the Interstate Commerce Commission to assume liability for \$560,000 of two per cent serial equipment trust certificates, maturing in 10 equal annual installments of \$56,000 on February 15 in each of the years from 1942 to 1951, inclusive. The issue has been sold at 100.029 to Harris Hall & Co., Inc., making the average annual cost to the company approximately 1.99 per cent.

MANCHESTER & ONEIDA.—Bonds.—This company has asked the Interstate Commerce Commission for authority to issue \$32,500 of first mortgage, 15-year, five per cent bonds, the proceeds to be used to redeem a like amount of first mortgage, six per cent bonds now outstanding and due on March 1, 1941.

PENNSYLVANIA.—Annual Report.—Continued improvement in business throughout the year, attributed to war conditions, brought the operating revenues of the Pennsylvania Railroad in 1940 to a total of \$477,593,408, an increase of \$46,662,630 over the previous year. Operating expenses increased \$31,553,843. Net income amounted to \$46,238,250, out of which \$9,341,585 was appropriated to sinking and other reserve funds, leaving a surplus of \$36,896,665. Selected items from the Income Statement follow:

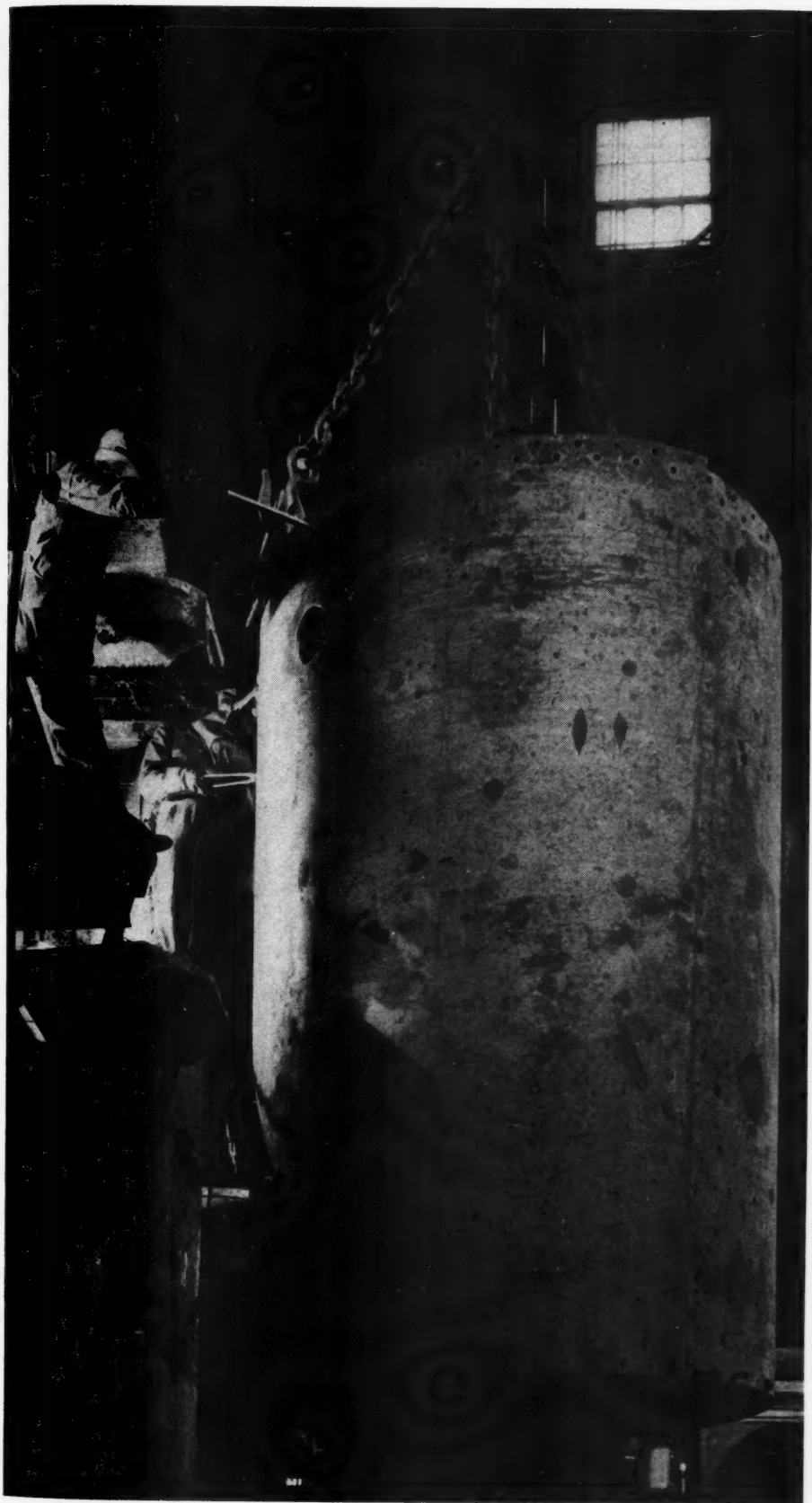
	1940	Increase or Decrease Compared with 1939
Operating Revenues	\$477,593,408	+\$46,662,630
Operating Expenses	338,454,678	+31,553,843
NET REVENUE	139,138,730	+15,108,787
Taxes	43,885,188	+3,789,341
Railway Operating Income	95,253,542	+11,319,446
Hire of equipment and joint facility rents	8,754,056	+2,124,288
NET RAILWAY OPERATING INCOME	86,499,486	+9,195,158
Non-Operating Income, chiefly dividends and interest on securities owned	*41,335,655	+4,471,425
GROSS INCOME	127,835,141	+13,666,583
Fixed Charges, chiefly rentals paid to leased roads, and interest on the company's debt	81,596,891	-539,142
NET INCOME	46,238,250	+14,205,725
Appropriations to Sinking and Other Funds, etc.	9,341,585	+486,746
Surplus	36,896,665	+13,718,979
Dividend of 3% (\$1.50 per share)	19,751,631	+6,583,877
Transferred to credit of Profit and Loss	17,145,034	+7,135,102

* Includes dividend of \$5,000,000 in securities received from Pennsylvania Company.

PENNSYLVANIA.—Abandonment.—This company has been authorized by Division 4 of the Interstate Commerce Commission to abandon the following lines:

1. That portion of the Morrison's Cove branch, extending from Curry, Pa., to Henrietta, three miles;
2. That portion of the Bellwood branch, extending from Bellwood, Pa., to Blandburg, 9.3 miles;
3. The Tearing Run branch, extending

Continued on next left-hand page



Guess-work
is eliminated
when
riveting
**LIMA
BOILERS**

Lima knows that every rivet that goes into a boiler has a grave responsibility and, therefore, the riveting pressure is carefully and accurately controlled.

Here is a "behind-the-scenes" view of the Lima bull-riveter. There is no guessing here as to whether the riveting pressure has done its job. Controls are automatically set to provide the proper riveting time and pressure which varies with the thickness of the plate and the size of the rivet.

This is just one of the numerous precautions taken at Lima to safeguard quality and build low maintenance into locomotives.

LIMA LOCOMOTIVE WORKS



INCORPORATED, LIMA, OHIO

from Graceton, Pa., to the terminus of the Tearing Run branch at valuation station 44 plus 62, 0.8 mile; and

4. The Kennerdell branch, extending from Kennerdell Tunnel, Pa., to the terminus of the Kennerdell branch at Kennerdell, 2.7 miles.

READING. — Bond Issue. — A banking group headed by Drexel & Co. offered publicly on February 28 an issue of \$8,000,000 of first (closed) mortgage bonds of the Philadelphia & Reading Terminal Railroad Company. The bonds comprise \$3,500,000 of serials dated March 1, 1941, and due March 1, 1942, to 1951, with coupons of 0.50 to 2.62 per cent and \$4,500,000 of sinking fund $3\frac{1}{2}$ per cent bonds dated March 1, 1941, and due March 1, 1966. The former are offered at par and the latter at 99. Principal, interest and sinking fund payments are unconditionally guaranteed by the Reading. Proceeds of the sale, together with funds of the Reading Company, will be used to pay at or before maturity \$8,500,000 outstanding Philadelphia & Reading 50-year 5's due May 1, 1941, which are guaranteed by the terminal company.

RICHMOND, FREDERICKSBURG & POTOMAC. — Bonds. — This company has been authorized by Division 4 of the Interstate Commerce Commission to issue \$6,500,000 of general mortgage, sinking-fund, three per cent bonds, to be sold and the proceeds applied to the redemption of \$4,000,000 of Washington Southern four per cent first mortgage gold bonds and \$2,680,000 of its $3\frac{1}{2}$ per cent general mortgage gold bonds. The new bonds, which will mature March 1, 1966, have been sold at par and accrued interest, \$3,600,000 to the New York Life Insurance Company and \$2,900,000 to the Equitable Life Assurance Society of the United States.

SOUTHERN NEW YORK. — Abandonment. — This company has been authorized by Division 4 of the Interstate Commerce Commission to abandon operation of a part of its line extending from West Oneonta, N. Y., to Jordanville, 41.2 miles, together with a branch from Index, N. Y., to Cooperstown, 2.1 miles.

Average Prices of Stocks and Bonds

	Mar. 4	Last week	Last year
Average price of 20 representative railway stocks..	29.01	29.30	31.50
Average price of 20 representative railway bonds..	62.15	62.15	58.87

Dividends Declared

Alabama & Vicksburg.—Capital, 3 per cent, semi-annually, payable April 1 to holders of record March 7.

Boston & Albany.—\$2.00, payable March 31 to holders of record February 28.

Chesapeake & Ohio.—75¢, quarterly; Preferred A, \$1.00, quarterly, both payable April 1 to holders of record March 7.

Erie & Pittsburgh.—87½¢, quarterly, payable March 10 to holders of record February 28.

Pittsburgh, Ft. Wayne & Chicago.—\$1.75, quarterly, payable April 1 to holders of record March 10; Preferred, \$1.75, quarterly, payable April 8, to holders of record March 10.

Reading.—2nd Preferred, 50¢, quarterly, payable April 10 to holders of record March 20.

Union Pacific.—\$1.50, Preferred, \$2.00, semi-annually, both payable April 1 to holders of record March 3.

Vicksburg, Shreveport & Pacific.—Preferred, 2½ per cent, semi-annually; Common, 2½ per cent, semi-annually, both payable April 1 to holders of record March 7.

Railway Officers

EXECUTIVE

Samuel M. Golden, whose appointment as vice-president in charge of maintenance of way and structures, equipment and stores of the Chicago Great Western, with headquarters at Chicago, was announced in the *Railway Age* of March 1, was born on September 26, 1900, and studied accounting at the Walton School of Commerce, becoming a certified public accountant in the State of Indiana in 1927. He started work in 1915 as an office boy for Louis Geyler Company, automobile distributors in Chicago, later serving as stenographer and cost clerk. In 1919 Mr. Golden became associated with Patrick H. Joyce, (now president and chairman of the Great Western), as cost clerk, later becoming chief cost accountant and then comptroller of the Illinois Car Manufacturing Company at Hammond, Ind., and its affiliated and subsidiary companies. In 1928 he was appointed assistant to the president of the Standard Steel Car Company and in 1932 he was appointed assistant to the president of the Chicago Great Western. In 1934 his title was changed to assistant to the president in charge of maintenance of way and structures, maintenance of equipment and stores. In February, 1935, when the Great Western petitioned to reorganize, Mr. Golden was appointed assistant to the trustees and on February 20, 1941, he was appointed vice-president in charge of maintenance of way and structures, equipment and stores.

FINANCIAL, LEGAL AND ACCOUNTING

Grant Ellis Chessman, assistant general auditor of the Elgin, Joliet & Eastern, has been promoted to general auditor, with headquarters as before at Chicago, succeeding **Percy L. Fisher**, who retired on March 1.

Mr. Chessman was born at Itasca, Ill., on March 20, 1891, and worked for the Pullman Company from 1907 to 1916. In the latter year he went with the Metropolitan Life Insurance Company and later with the American Life Insurance Company. He entered railway service on March 6, 1918, with the E. J. & E. and in 1920 was appointed special accountant on valuation work. He was promoted in 1928 to chief clerk to the assistant general auditor, and in 1934 to assistant general auditor, with headquarters as before at Chicago.

Mr. Fisher was born at Ligonier, Ind., on February 4, 1871, and entered railway service on March 1, 1885, with the Chicago and North Western. In 1900 he went with the Lake Shore & Michigan Southern (now part of the New York Central), and in 1909 with the American Locomotive Company, later becoming assistant controller of that company, with headquarters at New York. In July, 1917, Mr. Fisher went with the E. J. & E. as general auditor,

with headquarters at Chicago, which position he held until his retirement.

OPERATING

F. D. Keeler has been appointed superintendent of safety of the Pere Marquette, a newly created position, with headquarters at Grand Rapids, Mich.

O. H. Newman, trainmaster on the Union Pacific at La Grande, Ore., has been promoted to assistant superintendent, a newly created position, with headquarters at Portland, Ore., and **L. F. Carroll** has been appointed trainmaster at La Grande, succeeding Mr. Newman.

J. C. Pickens has been appointed superintendent of joint facilities of the Southern, effective March 1, with headquarters at Washington, D. C., in which capacity he will handle such matters relating to joint facilities and joint facility contracts, as well as other duties as may be assigned to him. Operation of all joint facilities will continue to be under the jurisdiction of respective operating officers presently charged with that responsibility. The position of joint facilities inspector has been abolished.

TRAFFIC

M. G. Dale has been appointed general agent of the St. Louis-San Francisco, with headquarters at Washington, D. C.

George J. Blech, general freight agent on the Southern Pacific, with headquarters at Los Angeles, Cal., has been promoted to freight traffic manager, Southern district, a newly created position with the same headquarters, and **A. G. Parker**, secretary to the vice-president in charge of system freight traffic at San Francisco, Cal., has been appointed assistant to the freight traffic manager, Southern district, at Los Angeles, also a newly created position. **V. F. Frizzell**, assistant general freight agent at Los Angeles, has been promoted to general freight agent at that point, and **C. M. Biggs**, assistant general freight agent at San Francisco, has been advanced to general freight agent at Los Angeles.

Arthur W. Richardson, general freight agent on the Wabash, with headquarters at St. Louis, Mo., has resigned to accept service with the Central Freight Association, Chicago, as a member of the Auxiliary Committee. **A. H. Bell**, merchandise agent on the Wabash at St. Louis, has been promoted to assistant general freight agent, with the same headquarters.

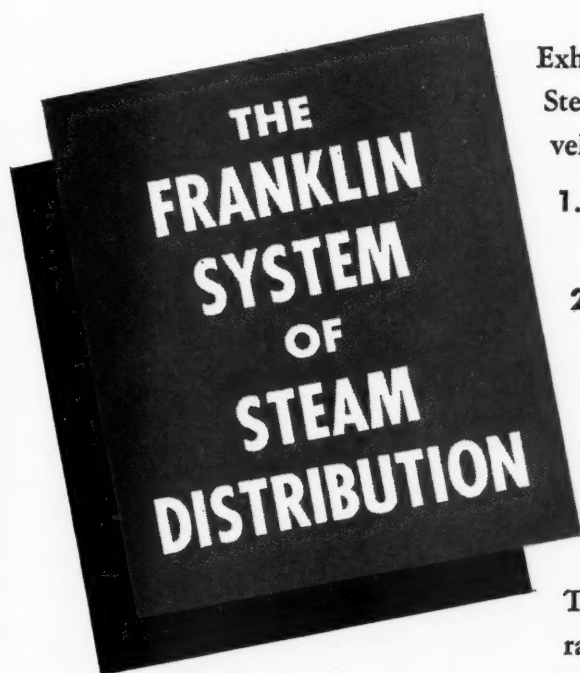
Mr. Richardson was born at Milwaukee, Wis., on March 29, 1898, and entered railway service on October 10, 1919, as a stenographer to the mechanical department of the Wabash at Chicago. After holding the positions of timekeeper in the mechanical department, clerk in the engineering department and stenographer in the transportation department, he was appointed rate clerk in the local freight office at Chicago on December 14, 1922. He held this position until November 24, 1924, when he was transferred to the office of the assistant freight traffic manager at Chicago, where

Continued on next left-hand page

Mean Effective Pressure *determines* Locomotive Performance

In a paper issued by the Office of Mechanical Engineer of the A. A. R. in February, 1939, covering A. A. R. Passenger Locomotive Tests in October, 1938, the following statement appears:

"... Nothing developed in the tests to indicate that any of the locomotives had reached the limit of boiler capacity. Therefore, the question of sustained power at high speeds becomes a question of mean effective pressure in the cylinders ..."



Exhaustive tests have demonstrated that the Franklin System of Steam Distribution makes it possible for a locomotive to develop the maximum mean effective pressure. It provides:

1. Separation of valve events, so that admission, cut-off, release and compression are independently controlled.
2. Larger inlet and exhaust passages and improved steam flow.
3. Reduced cylinder clearance volume.
4. Increased mechanical efficiency, obtained by reduced weight of moving masses, reduced friction and elimination of carbonization.

The Franklin System of Steam Distribution is offered to the railroads of the United States to meet the objective outlined in the A. A. R. report.



FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK
CHICAGO
MONTREAL

he was appointed assistant rate clerk on July 16, 1925, chief rate clerk on January 7, 1926, and representative of the freight department on May 1, 1929. On October 1 of the same year, he was appointed chief clerk to the freight traffic manager at St. Louis, and on June 4, 1922, chief clerk in the general freight office at St. Louis. On September 16, 1936, Mr. Richardson was promoted to general freight agent, with headquarters at St. Louis.

E. J. Dean, freight traffic manager on the Erie, with headquarters at Cleveland, Ohio, has been transferred to New York, succeeding **Thomas E. McAndrews**, whose appointment as assistant to the president of the Virginian, with headquarters at Norfolk, Va., was announced in the *Railway Age* of February 1. **G. O. Lamb**, assistant general freight agent on the Erie at Pittsburgh, Pa., has been promoted to freight traffic manager at Cleveland, replacing Mr. Dean, and **C. E. King**, general agent at Akron, Ohio, has been advanced to assistant general freight agent at Pittsburgh, relieving Mr. Lamb. **A. R. Walton**, general agent at Newark, N. J., has been transferred to Akron, succeeding Mr. King. **R. E. O'Grady**, manager of perishable and dairy freight traffic at New York, has been promoted to coal traffic manager at Cleveland, relieving **W. H. Stadelman**, who has been appointed general agent at Atlanta, Ga., replacing **C. G. Andrews**, who has been transferred to St. Louis, Mo. Mr. Andrews succeeds **D. C. Kelsey**, who has been promoted to manager of perishable and dairy freight traffic at New York, relieving Mr. O'Grady. **H. F. Studt**, commercial agent at Kansas City, has been promoted to general agent at Tulsa, Okla., succeeding **H. A. Bockman**, who has been transferred to Des Moines, Iowa. Mr. Bockman replaces **L. T. Coulston**, who has been transferred to Milwaukee, Wis., relieving **H. A. Wilson**, who has been appointed division freight agent at Jamestown, N. Y.

G. Walter Rodine, general agent, passenger department, on the Northern Pacific at Chicago, has been promoted to general passenger agent, with headquarters at



G. Walter Rodine

Seattle, Wash., succeeding **C. L. Townsend**, who retired on March 1, and **Forest G. Scott**, city passenger agent at Chicago, has been advanced to general agent, pas-

senger department, at that point, relieving Mr. Rodine.

Mr. Rodine was born in Chicago in 1894, and entered railway service with the Atchison, Topeka & Santa Fe in 1913. During the first World War he served in the U. S. Navy, afterwards returning to the Santa Fe. On June 16, 1921, he went with the Northern Pacific in the passenger department at Chicago and was later appointed traveling passenger agent successively at Cleveland, Ohio and Milwaukee, Wis. In 1925 he was appointed special passenger representative at St. Paul, Minn., and in 1926 he was promoted to assistant general agent at Chicago. Mr. Rodine was advanced to general agent, passenger department in 1931, which position he has held until his recent promotion, effective March 1.

John M. Spann, assistant freight traffic manager on the Chicago, Rock Island & Pacific at Little Rock, Ark., has been promoted to freight traffic manager in charge of solicitation, a newly created position, with headquarters at Chicago and **J. W. E. Trefz**, assistant general freight agent at Denver, Colo., has been promoted



John M. Spann

to perishable freight traffic manager in charge of solicitation-perishable traffic, also a newly created position, with headquarters at Chicago. **E. E. Strickland**, assistant freight traffic manager at Chicago, has been appointed assistant freight traffic manager-solicitation, with the same headquarters, a change of title. **J. L. McVay**, general freight agent, has been appointed assistant freight traffic manager-solicitation, with headquarters as before at Chicago, and **J. A. Roach**, general agent, freight department, at Chicago has been appointed general freight agent, in charge of solicitation in the Chicago district, a change of title.

Mr. Spann was born in Pilot Point, Tex., in 1901, and entered railway service in 1917 as a clerk in the Ft. Worth & Denver City at Amarillo, Tex. In 1924 he was promoted to chief clerk of the freight traffic department, and in 1926 he went with the Rock Island as city freight agent at Amarillo. In 1935 he was advanced to division freight agent and on June 1, 1936, he was promoted to assistant freight traffic manager, with headquarters at Little Rock.

Mr. Trefz was born at St. Louis, Mo. in 1889, and entered railway service in

1920 as a rate clerk on the El Paso & Southwestern (now part of the Southern Pacific), at El Paso, Tex. In 1924 he was appointed traveling freight and pas-



J. W. E. Trefz

senger agent at Oklahoma City, Okla., but returned to El Paso as rate clerk in 1925. Later in 1925 he went with the Rock Island as traveling freight agent at El Paso and in 1926 he was promoted to general agent at Phoenix, Ariz. Mr. Trefz was advanced to assistant general freight agent at Denver in 1939, the position he held until his recent promotion.

ENGINEERING AND SIGNALING

Charles H. Blackman, principal assistant engineer of the Louisville & Nashville, with headquarters at Louisville, Ky., has been promoted to assistant chief engineer, a newly created position, with the same headquarters, and **George T. Tate**, assistant engineer, has been promoted to principal assistant engineer, succeeding Mr. Blackman.

Ned V. Scott, whose promotion to engineer of water and fuel service of the Southern Pacific Lines in Texas and Louisiana, with headquarters at Houston, Tex., was announced in the *Railway Age* of February 22, was born at Swanton, Ohio, on November 13, 1890, and graduated from the University of Alabama in 1911, from the University of Michigan in 1914, and took post graduate work at the latter institution in 1915. From 1915 to 1917, he worked on construction on the Southern, and from 1917 to 1919 he served in the U. S. Army as a second lieutenant in the 215th engineers. In 1919 he returned to railroad service on the Southern Pacific. In 1924 Mr. Scott was promoted to assistant engineer in the office of the chief engineer and since that time, has been in charge of various large construction projects, including the construction of the 230-ft. bascule bridge over the Neches river at Beaumont, Tex., which is the longest single leaf railroad span in the world. His promotion to engineer of water and fuel service was effective February 1.

Joseph W. Smith, principal assistant engineer of the Erie, has been promoted to chief engineer, with headquarters as before at Cleveland, Ohio, succeeding **George S. Fanning**, whose death on January 2, was announced in the *Railway Age* of

SUPPOSE EVERY RAILROAD



HAD ITS OWN

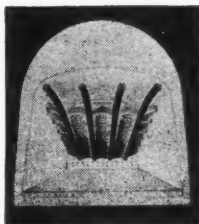
ARCH

BRICK DESIGN

Look about and see how standards on many items vary with each railroad. « « « Think of the confusion and expense involved if this also applied to Arch Brick. « « « If a road ran short, it would wait for weeks for its special brick to be made! At joint terminals the confusion would be unendurable. « « « Years ago, American Arch Company foresaw such a situation and fostered the standardization of Arch tubes and of Arch Brick sizes and designs. « « « Think of the grief this good work saved. « « « In everything having to do with Arch Brick, American Arch Company for 32 years has served the railroads. This service has had and still has a high value.

THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK

**HARBISON-WALKER
REFRACTORIES CO.**
Refractory Specialists



AMERICAN ARCH CO.
INCORPORATED
60 EAST 42nd STREET, NEW YORK, N. Y.
*Locomotive Combustion
Specialists*

January 11. Mr. Smith was born at Hazleton, Pa., on August 8, 1879, and graduated in civil engineering from Lafayette College in 1904. He entered railway service



Joseph W. Smith

with the Erie in June of that year as a transitman on preliminary surveys, and in September, 1905, he was promoted to an inspector on construction work. In February, 1907, he was promoted to resident engineer on terminal improvements, later serving on double track and grade reduction work, and in February, 1912, he was promoted to assistant engineer on double track and grade reduction work. In January, 1914, he was advanced to district engineer on terminal improvements, with headquarters at New York City, and in February, 1917, he was further promoted to assistant valuation engineer. In June, 1925, he was promoted to general office engineer, and four years later he was advanced to principal assistant engineer, with headquarters at New York. His headquarters were later transferred to Cleveland.

MECHANICAL

Paul O. Christy, whose promotion to superintendent of equipment on the Illinois Central, with headquarters at Chicago, was announced in the *Railway Age*



Paul O. Christy

of February 22, was born at Water Valley, Miss., on August 1, 1898, and entered railway service on May 1, 1912, as a call boy in the mechanical department at Water

Valley, later serving as a clerk and a machinist apprentice at Water Valley, a timekeeper at Memphis, Tenn., and a machinist apprentice at McComb, Miss. During the first World War he served as a machinist mate in the U. S. Navy, returning to McComb on August 16, 1919. Mr. Christy was promoted to machinist on March 1, 1920, and served in that capacity successively at Baton Rouge, La., Memphis, and Asylum, Miss. On October 17, 1925, he was promoted to roundhouse foreman at Gwin, Miss., and was later transferred to Asylum. On October 1, 1930, he was advanced to general foreman and on January 1, 1935, he was transferred to Centralia, Ill. Mr. Christy was promoted to assistant master mechanic at the Markham yards, Chicago, on May 1, 1937, and on January 16, 1938, he was advanced to master mechanic at Paducah, Ky., which position he held until his recent promotion, effective February 16.

L. R. (Ray) Christy, master carbuilder of the Gulf Coast Lines and of the International-Great Northern, with headquarters at Houston, Tex., has been promoted



L. R. (Ray) Christy

to superintendent of the car department of the Missouri Pacific Lines, with headquarters at St. Louis, Mo., and the positions of master car builder on the Missouri Pacific, the Gulf Coast Lines, and the International-Great Northern have been abolished.

Mr. Christy was born at Water Valley, Miss., on December 19, 1894, and entered railway service on the Illinois Central as a car repairer apprentice at Water Valley. In April, 1912, he was appointed car repairer, and later served as air brake repairer, car inspector, chief clerk and traveling master car builder inspector. On June 9, 1916, he went with the Southern Pacific at Tuscon, Ariz., as M. C. B. clerk and until January 31, 1922, he alternately worked in various capacities in the mechanical department at Tuscon and attended the University of Arizona. Mr. Christy returned to the Illinois Central on February 3, 1922, as an air brake foreman at Memphis, Tenn., later being appointed rebuilding car foreman. On March 1, 1924, he went with the Missouri Pacific as assistant general car inspector, and a short time later was advanced to general car inspector. On February 16, 1926, he was promoted to master car builder of the Gulf

Coast Lines and the International-Great Northern, with headquarters at Houston. His promotion to superintendent of the car department of the Missouri Pacific lines was effective March 1.

C. R. Kerr has been appointed general car foreman of the Union railroad, with headquarters at East Pittsburgh, Pa., to succeed E. H. Waterman, who has been promoted to master car builder.

L. E. Hilsabeck, general car inspector of the Chicago Great Western, has been promoted to assistant superintendent of the car department, a newly created position, with headquarters as before at Oelwein, Iowa.

PURCHASES AND STORES

J. J. Jirousek, assistant storekeeper on the Chicago, Burlington & Quincy at Aurora, Ill., has been appointed division storekeeper at Hannibal, Mo., succeeding J. H. Ellis, who retired on March 1. J. W. Schwartz, division storekeeper at St. Joseph, Mo., has been promoted to assistant storekeeper at Aurora, replacing Mr. Jirousek, and W. F. Myers, general storekeeper of the Fort Worth & Denver City, with headquarters at Childress, Tex., has been appointed division storekeeper at St. Joseph, relieving Mr. Schwartz. V. W. Mitchell, chief clerk to the storekeeper at Aurora, has been advanced to general storekeeper of the F. W. & D. C., at Childress, succeeding Mr. Myers.

OBITUARY

Fred M. Woodall, who retired in 1939 as assistant superintendent on the Louisville & Nashville at Louisville, Ky., died at Atlanta, Ga., on March 1.

William E. Rauch, industrial agent for the South-Central district of the Union Pacific, with headquarters at Los Angeles, Cal., died suddenly of a heart attack at his home in Glendale, Cal., on February 24.

Ernest E. Hanna, who retired as division superintendent on the Missouri-Kansas-Texas, with headquarters at Denison, Tex., on October 15, 1936, died at that point at the age of 68, on January 16, after four years' illness. Mr. Hanna began railway service as an agent-operator on the Lake Erie & Western (now part of the Nickel Plate) at Lima, Ohio, and in 1913, he went with the M-K-T as a clerk in the superintendent's office at McAlester, Okla.

Charles Henry Schlacks of Bryn Mawr, Pa., a former president of the Union Oil Company of Delaware and from 1904 to 1913 operating vice-president of the Denver & Rio Grande Western, died at the Huntington Memorial Hospital, Pasadena, Cal., on March 3. Mr. Schlacks was born in Chicago on November 12, 1865. He was also a vice-president of the Western Pacific from 1910 to 1913. At the time of his death he was a director of numerous industrial concerns, including the Baldwin Locomotive Works, the Midvale Steel Corporation and the Barber Asphalt Company.

IN AN EMERGENCY

Yesterday's **LOCOMOTIVES...**

will be brought back into main line service to help keep the increased car loadings "rolling along".

In most cases the limiting factor of these locomotives is their capacity. This can be substantially increased by the employment of higher degrees of superheat and the application of Elesco feedwater heaters.

The Superheater Company has anticipated the necessity for the rejuvenation of these older locomotives and is ready with suggestions.

Let us confer with you in regard to your power problems.



SUPERHEATERS • FEEDWATER HEATERS
AMERICAN THROTTLES • STEAM DRYERS
EXHAUST STEAM INJECTORS • PYROMETERS

THE
SUPERHEATER
C O M P A N Y

Representative of
AMERICAN THROTTLE COMPANY, INC.
60 East 42nd Street, NEW YORK
122 S. Michigan Ave. CHICAGO

Montreal, Canada
THE SUPERHEATER COMPANY, LTD.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1941

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger	Total (inc. misc.)	Way and structures	Equip-ment	Traffic			1941	1940
Akron, Canton & Youngstown	171	\$229,083	\$47	\$237,695	\$27,379	\$21,151	\$14,158	57.5	\$101,088	\$77,539	\$63,928
Alton	959	993,138	245,653	1,448,774	136,271	236,271	44,792	75.2	359,070	1,089,373	67,340
Atchison, Topeka & Santa Fe System	13,431	11,434,791	1,723,211	14,319,983	1,673,017	3,242,393	441,130	76.5	3,359,536	1,848,406	1,814,350
Atlanta & West Point	93	123,444	35,666	181,686	20,029	26,479	8,114	75.9	43,872	27,810	11,356
Western of Alabama	133	119,997	36,440	174,913	19,382	32,359	7,782	76.1	41,767	23,332	2,366
Atlanta, Birmingham & Coast	639	290,318	44,973	335,613	53,526	56,458	22,582	83.1	59,797	35,325	—16,785
Atlantic Coast Line	5,099	4,135,843	1,157,872	5,780,249	434,256	886,501	190,731	66.6	1,928,715	1,428,715	1,190,706
Charleston & Western Carolina	343	256,677	2,165	263,769	22,423	34,294	8,440	57.1	113,070	78,070	77,118
Baltimore & Ohio	6,385	14,413,508	1,078,797	16,378,065	1,483,155	3,795,396	367,945	72.4	4,522,646	3,515,975	3,162,205
Staten Island Rapid Transit	24	62,476	66,054	136,285	14,661	21,405	1,120	96.0	5,509	—19,807	—27,467
Bangor & Aroostook	224	922,813	825	934,249	119,261	340,310	12,042	75.63	227,691	89,890	170,820
Besmer & Lake Erie	1,906	3,116,642	637,604	4,224,112	613,142	600,187	64,795	74.9	1,060,711	740,185	521,566
Boston & Maine	235	59,361	17,373	85,989	18,972	16,158	4,733	118.5	—15,940	—25,560	—11,980
Burlington, Rock Island	37	173,648	.....	173,648	5,959	59,429	428	51.08	85,005	36,299	110,637
Cambria & Indiana	234	391,783	15,115	422,375	26,842	65,858	6,726	56.2	184,867	172,679	139,711
Canadian Pacific Lines in Maine	91	92,986	9,741	114,461	10,580	29,790	2,440	96.2	4,405	—1,700	—32,909
Central of Georgia	1,863	1,227,280	153,809	1,542,331	178,834	293,790	55,216	81.6	284,356	165,073	145,659
Central of New Jersey	711	2,726,104	336,050	3,251,393	266,732	801,054	43,837	77.7	726,457	307,251	117,559
Central Vermont	422	452,317	33,697	519,654	48,705	100,695	10,827	80.6	123,860	76,247	28,289
Chesapeake & Ohio	3,131	9,737,536	314,505	10,337,673	1,068,798	2,059,921	193,221	59.4	4,192,739	2,738,296	2,831,473
Chicago & Eastern Illinois	923	1,173,834	165,760	1,494,880	141,837	259,706	545,125	72.2	415,263	330,263	214,974
Chicago & Illinois Midland	131	413,980	605	434,983	44,879	72,918	27,850	92.6	162,515	105,893	100,479
Chicago & North Western	8,319	5,534,234	966,992	7,367,603	937,257	1,347,373	192,146	78.9	1,553,685	965,230	601,918
Chicago, Burlington & Quincy	8,958	6,557,845	800,228	8,215,495	587,318	1,341,449	231,073	66.9	2,723,134	2,018,481	1,664,455
Chicago, Great Western	1,502	1,473,879	67,819	1,659,027	183,150	235,914	62,850	69.9	499,911	184,409	70,272
Chicago, Indianapolis & Louisville	549	725,119	39,616	830,874	70,836	162,193	25,913	70.9	242,146	194,613	104,275
Chicago, Milwaukee, St. Paul & Pacific	10,855	8,074,525	754,766	9,702,449	818,619	1,783,794	363,014	70.7	2,842,651	2,117,651	1,756,422
Chicago, Rock Island & Pacific	7,997	5,408,591	938,578	6,898,680	600,978	1,233,078	255,065	73.2	1,847,312	1,354,619	1,059,371
Chicago, St. Paul, Minneapolis & Omaha	1,629	1,210,314	139,465	1,444,477	145,965	251,453	40,216	83.6	237,292	122,165	3,430
Clinchfield Railroad	308	866,250	3,446	875,827	31,891	133,777	18,536	41.7	510,349	433,604	440,810
Colorado & Southern	786	511,693	34,520	600,179	32,886	10,442	12,887	67.3	196,365	128,551	95,314
Fort Worth & Denver City	804	321,696	50,307	440,160	54,620	71,803	16,764	76.6	102,890	68,105	42,343
*Colorado & Wyoming	42	91,031	.....	140,693	4,148	11,362	554	44.3	78,349	46,568	45,800
Columbus & Greenville	168	94,934	3,147	103,606	14,269	16,712	3,936	88.0	12,440	3,666	4,801
Delaware & Hudson	845	2,220,563	86,765	2,383,220	253,937	457,422	41,190	71.9	670,184	513,998	476,643
Delaware, Lackawanna & Western	995	3,599,358	543,464	4,596,200	255,476	772,120	109,675	72.2	1,279,251	831,251	799,465
Denver & Rio Grande Western	2,550	1,904,001	146,106	2,150,127	140,866	590,161	78,936	78.2	468,958	258,936	240,109
Denver & Salt Lake	232	213,335	6,143	228,741	21,800	41,720	2,547	63.1	84,338	59,087	104,996
Detroit & Mackinac	242	35,418	4,291	48,865	8,116	11,359	1,086	100.8	—376	—3,649	—7,550
Detroit & Toledo, Shore Line	579	395,323	.....	395,323	20,490	25,726	8,278	39.2	241,185	179,807	115,058
Detroit, Toledo & Ironton	472	800,983	.....	822,494	53,380	92,736	12,152	42.4	473,996	328,888	294,555
Duluth, Missabe & Iron Range	541	82,557	1,141	104,356	152,571	227,912	4,444	560.9	—481,025	—818,107	—826,638
Duluth, Winnipeg & Pacific	175	148,477	1,683	153,289	16,007	20,963	1,943	67.4	49,929	38,178	17,759
Elgin, Joliet & Eastern	390	2,092,177	.....	2,375,617	148,513	351,729	15,488	55.8	1,051,103	754,724	603,206

*Became Class I road January 1, 1941.

Continued on next left-hand page

AIR...
Compressors
Type 3-CD

Designed Especially
for a Specific Purpose!



Diesel - Electric Switchers

An ample supply of air is necessary for brake operations in switching service. But how much is enough? To ascertain this with certainty we conducted laboratory experiments that disclosed the volume of air which could be utilized in charging trains of various lengths. From this data it was determined what compressor capacity would be required while the engine idles, since this is when a train is being charged ★ As direct drive is usually the most suitable, it followed that the compressor must operate over a wide range of speeds between idling and maximum. Durability was therefore a requirement, and the need for reliable performance is obvious. Since installation space is limited, a compact structure was also essential ★ The Westinghouse 3-CD Air Compressor was designed and built to embody all those characteristics that make it exactly suited for this specific purpose. Many have been placed in service with noteworthy results ★ Let our representative tell you all about the details of this compressor.



The 3-CD Air Compressor is a three cylinder, air-cooled, compound type, with intercooler. It has a dependable load and unload type of control; positive pressure lubricating system; a highly-effective suction filter; and many other features. Dependable, long-time service is assured.

WESTINGHOUSE AIR BRAKE CO.

WILMERDING, PENNSYLVANIA

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1941—CONTINUED

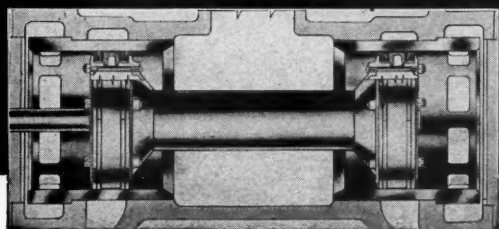
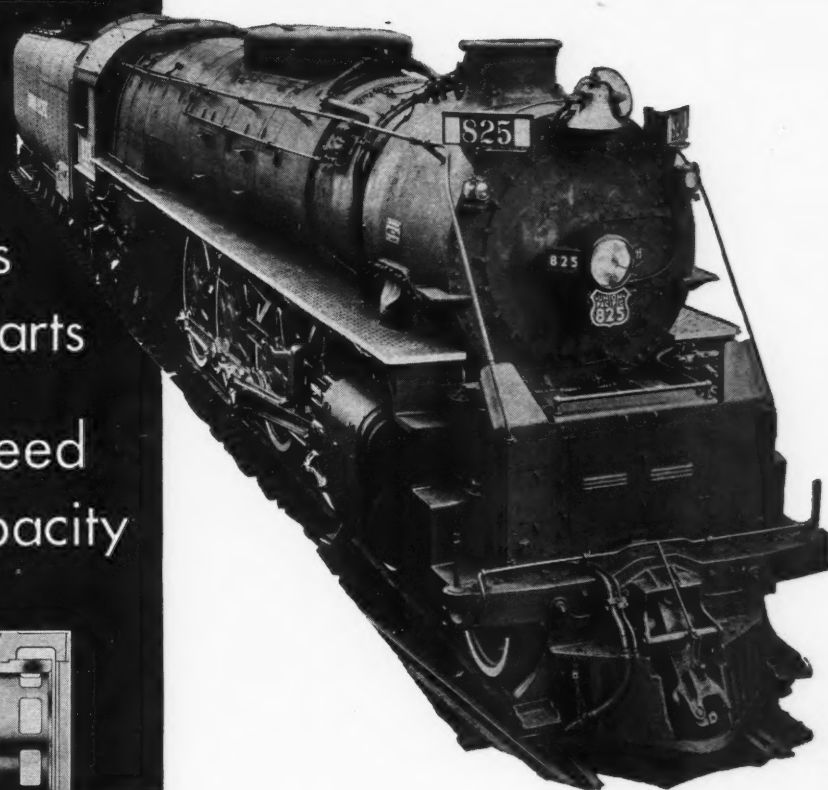
Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income			
		Freight	Passenger	Total (inc. misc.)	Maintenance of way and structures	Equip-ment	Traffic			Trans-portion	Total	1941	1940
Erie	2,266	\$6,772,979	\$172,250	\$7,595,367	\$497,554	\$1,358,279	\$177,790	\$2,814,036	\$5,121,533	67.4	\$2,473,834	\$1,577,219	\$1,080,317
Florida East Coast	685	662,106	51,920	1,320,755	107,009	173,876	16,717	449,113	869,947	65.9	450,808	283,993	258,403
Georgia Railroad	329	345,904	17,392	385,850	30,935	60,427	18,510	159,341	283,213	73.4	102,637	92,188	32,197
Georgia & Florida	408	100,051	1,263	105,126	23,210	15,669	9,044	39,851	93,218	88.7	11,908	4,131	—1,288
Grand Trunk Western	1,029	2,134,194	73,561	2,364,517	234,387	433,427	37,086	928,905	1,702,121	72.0	662,393	387,469	286,118
Canadian National Lines in New England	172	111,183	4,287	134,341	22,773	18,629	1,418	63,170	111,292	82.8	23,049	33,783	61,749
Great Northern	8,066	5,255,531	346,463	6,086,406	744,433	1,589,437	171,788	2,454,038	5,220,161	85.8	866,245	27,581	229,426
Green Bay & Western	234	164,622	290	168,860	20,475	19,095	9,220	53,589	107,300	63.5	61,560	36,856	23,849
Gulf & Ship Island	259	113,954	12,948	136,346	17,594	17,610	3,200	57,834	102,609	75.3	33,737	2,717	—38,375
Gulf, Mobile & Ohio	1,973	1,628,353	46,476	1,742,174	225,084	276,596	81,718	328,692	1,213,623	69.7	528,551	342,551	50,651
Illinois Central	4,949	7,621,933	981,852	9,195,270	855,541	1,764,951	239,614	3,286,428	6,473,372	70.4	2,719,898	1,973,310	1,219,068
Yazoo & Mississippi Valley	1,608	1,170,930	55,665	1,302,948	118,121	181,413	37,326	319,435	904,275	69.4	398,673	253,790	63,629
Illinois Central System	6,557	8,792,863	1,037,517	10,498,218	933,662	1,946,364	276,940	3,805,863	7,379,647	70.3	3,118,571	2,224,980	1,290,610
Illinois Terminal	377	391,756	61,478	500,798	46,821	76,873	17,163	177,163	337,325	67.36	163,473	113,060	103,137
Kansas City Southern	879	1,122,485	44,593	1,304,274	118,640	206,600	54,831	377,493	816,916	62.6	487,358	377,358	289,739
Kansas, Oklahoma & Gulf	328	200,581	408	203,787	8,742	10,587	8,769	44,298	83,079	40.8	120,708	98,812	88,409
Lake Superior & Ishpeming	156	28,499	74	30,929	17,052	28,111	564	21,434	74,026	239.3	—43,097	—66,977	—66,888
Lehigh & Hudson River	96	160,400	.....	161,275	18,000	27,274	3,716	49,697	104,936	65.1	56,339	36,822	14,788
Lehigh & New England	190	358,666	.....	360,801	28,106	47,846	7,594	114,464	213,343	59.1	147,458	101,830	105,772
Lehigh Valley	1,269	3,769,011	165,977	4,160,560	252,126	618,721	103,128	1,703,919	2,805,634	67.4	1,354,626	1,041,910	820,445
Louisiana & Arkansas	381	741,430	18,800	787,272	108,101	87,919	28,676	201,644	457,839	58.2	329,433	237,026	139,592
Louisville & Nashville	4,871	7,837,537	732,298	9,122,029	949,672	1,958,115	189,266	2,975,786	6,362,518	69.7	2,759,511	1,735,922	1,432,260
Maine Central	291	988,828	74,268	1,159,570	149,219	195,004	11,346	442,453	832,889	71.8	326,681	248,370	208,748
Midland Valley	352	115,987	4	118,066	8,412	9,631	2,406	31,349	58,488	49.5	59,598	48,729	60,348
Minneapolis & St. Louis	1,409	689,477	8,747	731,282	83,783	134,283	50,706	279,694	585,831	80.1	145,451	101,950	46,095
Minneapolis, St. Paul & Sault Ste. Marie	4,267	1,951,801	64,404	2,166,990	282,042	370,279	63,528	1,018,609	1,828,509	84.4	337,781	158,967	15,346
Duluth, South Shore & Atlantic	350	176,321	7,618	196,170	26,254	34,915	8,023	81,820	157,840	80.5	38,330	24,130	—20,823
Spokane International	152	52,372	664	60,121	7,174	6,227	2,212	21,533	41,093	68.4	19,028	13,964	7,850
Mississippi Central	158	92,049	6,794	101,392	13,197	11,078	7,522	25,629	61,610	60.8	39,782	27,927	5,718
Missouri & Arkansas	365	89,714	1,394	104,352	22,149	12,802	7,232	34,786	82,104	78.7	22,248	17,791	8,496
Missouri-Illinois	193	188,837	232	190,932	17,241	19,313	3,107	48,910	94,442	49.5	96,490	69,836	59,234
Missouri-Kansas-Texas Lines	3,293	1,917,102	213,062	2,354,985	295,291	371,990	107,638	931,368	1,832,144	77.8	522,841	356,083	75,066
Missouri Pacific	7,146	6,828,074	586,556	8,083,737	909,041	1,395,330	260,062	2,901,607	5,712,097	70.7	2,371,640	1,871,979	914,628
Gulf Coast Lines	1,772	1,322,080	36,642	1,435,287	192,638	180,026	42,329	439,206	907,207	63.2	528,000	449,220	312,026
International Great Northern	1,155	836,363	86,784	1,028,889	164,540	192,679	27,996	408,530	836,210	81.3	192,679	130,600	39,692
Monongahela	172	392,751	481	395,055	29,830	32,688	470	94,273	159,978	40.5	235,077	180,677	97,461
Montour	51	153,219	.....	155,884	9,455	37,878	731	44,587	99,171	63.6	56,713	27,888	64,353
Nashville, Chattanooga & St. Louis	1,111	1,183,668	138,148	1,472,764	131,122	279,777	69,305	553,062	1,090,553	74.0	382,211	268,200	170,472
Nevada Northern	165	47,396	589	52,115	9,144	2,781	1,218	11,000	30,159	57.9	21,956	6,765	23,788
New York Central	10,943	24,950,799	5,539,509	33,808,774	2,855,817	7,316,474	541,066	12,643,243	24,704,545	73.1	9,104,229	5,975,975	3,796,096
Pittsburgh & Lake Erie	233	1,951,765	46,981	2,057,395	172,866	682,284	37,219	652,000	1,628,708	79.2	428,687	1,707,93	472,397
New York, Chicago & St. Louis	1,704	4,111,876	74,326	4,293,523	357,033	593,483	114,574	1,417,091	2,610,901	60.8	1,682,622	1,347,270	794,914
New York, New Haven & Hartford	1,853	4,650,705	2,224,689	7,601,189	815,391	1,225,275	101,548	2,937,096	5,484,277	72.2	2,116,912	1,550,412	741,034
New York Connecting	21	330,472	.....	337,833	38,648	9,844	28,586	78,451	78,451	23.2	259,382	214,166	124,476
New York, Ontario & Western	576	392,317	6,853	445,443	45,372	95,263	14,959	252,232	429,103	96.3	16,340	—27,080	—59,425

Continued on next left-hand page

HSGI

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PERFORMANCE records of locomotives equipped with HSGI Light Weight Valves show unusual low maintenance attention for all valve chamber parts and valve gear components.

These records also show a big improvement in locomotive efficiency because HSGI Light Weight Valves act more promptly and positively during cut-off adjustments.

The fact that weight has been reduced to a minimum means that all wearing parts will give longer service. All engines equipped have more "pep"—consume less fuel and cost less to maintain.

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- Cylinder Packing Rings
- Pistons or Piston Bull Rings
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- Crosshead Shoes
- Hub Liners
- Shoes and Wedges
- Floating Rod Bushings

Finished Parts

- Dunbar Sectional Type Packing
- Duplex Sectional Type Packing for Cylinders and Valves
- (Duplex Springs for Above)
- Sectional Packing
- Cylinder Snap Rings
- Valve Rings All Shapes
- Light Weight Valves
- Cylinder Liners and Pistons for Diesel Service

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HUNT-SPILLER GUN IRON

Air Furnace

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY OF CALENDAR YEAR 1941—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income		
		Freight	Passenger	Total (inc. misc.)	Maintenance of way and structures	Equip-ment	Traffic			Trans- portation	Total	Operating income	1941	1940
New York, Susquehanna & Western	144	\$258,853	\$27,331	\$300,888	\$18,974	\$22,278	\$2,742	\$128,408	\$182,765	\$88,499	\$52,679	\$69,177
Norfolk & Western	2,191	9,220,347	262,075	9,716,246	956,840	1,960,458	136,898	1,967,230	5,235,778	2,652,267	2,937,497	3,100,302
Norfolk Southern	733	371,333	3,246	387,356	68,979	54,357	22,498	142,368	310,647	44,005	26,520	23,838
Northern Pacific	6,718	4,372,706	328,934	5,148,732	621,715	1,135,108	152,955	2,071,454	4,264,299	264,045	634,822	458,639
Northwestern Pacific	352	194,573	24,295	242,177	61,184	45,122	2,548	148,926	262,860	41,102	55,711	80,628
Oklahoma City-Ada-Tulsa	132	20,833	—	21,200	3,829	710	732	8,673	15,277	3,493	495	2,836
Pennsylvania	10,246	31,983,624	7,235,955	42,603,255	4,136,169	10,124,712	721,402	15,243,411	31,655,220	7,089,281	6,733,386	5,855,336
Long Island	379	630,898	1,146,928	1,883,197	213,027	336,174	8,032	959,604	1,556,636	116,661	51,691	37,662
Pennsylvania-Reading Seashore Lines	411	293,003	75,004	389,305	83,381	89,461	6,241	273,961	468,322	155,121	230,180	245,185
Pere Marquette	2,102	2,904,656	88,285	3,124,077	346,458	566,655	60,634	1,086,018	2,158,710	676,884	536,773	447,248
Pittsburgh & Shawmut	98	80,911	.....	81,434	12,063	18,417	1,853	22,529	59,421	19,408	12,738	6,649
Pittsburgh & West Virginia	136	356,808	.....	379,388	59,481	67,749	18,494	80,061	245,235	109,420	120,658	122,706
Pittsburgh, Shawmut & Northern	190	134,412	.....	135,801	13,205	17,727	1,015	40,152	4,079,050	53,015	43,347	31,185
Reading	1,440	5,486,526	296,629	6,032,227	429,089	1,230,115	69,955	2,201,539	13,333,606	1,275,394	1,182,874	1,182,874
Richmond, Fredericksburg & Potomac	118	564,058	402,463	1,078,744	74,194	158,585	9,838	385,127	685,776	269,104	181,309	111,983
Rutland	407	188,081	27,633	273,670	32,036	61,045	10,332	161,668	281,314	27,089	26,549	5,606
St. Louis-San Francisco	4,769	3,650,900	384,274	4,387,038	519,538	882,198	118,515	1,575,746	3,278,863	781,272	832,978	234,719
St. Louis, San Francisco & Texas	159	116,054	1,796	122,470	22,127	13,980	7,901	52,900	102,077	16,524	11,487	36,032
St. Louis Southwestern Lines	1,649	1,897,842	40,695	2,011,415	232,032	306,261	84,050	588,637	1,291,590	606,868	453,511	182,486
Seaboard Air Line	4,310	3,723,857	1,027,997	5,166,244	605,520	933,894	197,637	1,893,719	3,903,095	888,149	666,423	538,310
Southern Railway	6,567	8,547,932	904,781	10,137,788	1,107,334	1,646,073	178,931	3,384,609	6,667,246	2,432,220	2,096,942	1,359,811
Alabama Great Southern	315	615,120	90,121	750,757	89,683	175,294	15,398	217,747	523,319	125,372	115,179	43,467
Cincinnati, New Orleans & Texas Pacific	337	1,440,139	223,165	1,749,415	159,187	323,505	28,565	436,874	1,006,553	517,864	521,997	377,798
Georgia Southern & Florida	398	245,292	75,240	371,658	39,081	44,677	2,408	127,620	224,978	106,313	80,813	17,134
New Orleans & Northeastern	204	297,908	49,919	368,091	31,853	41,897	6,746	116,465	210,101	97,421	75,493	32,320
Southern Pacific	8,607	12,467,239	1,745,696	15,407,481	1,368,949	2,519,279	330,988	5,737,089	10,795,172	3,412,180	2,687,543	959,134
Southern Pacific Steamship Lines	...	778,294	19,621	843,778	28,162	113,738	17,980	566,295	741,208	73,681	71,373	80,945
Texas & New Orleans	4,417	3,485,654	339,475	4,148,960	537,893	672,787	115,533	1,399,484	2,926,063	916,690	654,220	405,247
Spokane, Portland & Seattle	948	690,122	28,957	773,064	110,484	79,862	10,098	283,078	513,228	181,911	108,698	46,169
Tennessee-Central	286	218,474	3,948	236,207	32,189	32,794	6,043	81,232	162,126	57,127	42,019	40,841
Texas & Pacific	1,887	1,973,136	227,426	2,402,870	236,366	473,467	76,182	750,316	1,651,133	591,599	502,151	318,787
Texas Mexican	162	75,973	147	90,181	15,609	11,966	3,096	31,786	69,397	20,784	11,668	867
Toledo, Peoria & Western	239	210,336	3	213,047	40,151	17,084	18,416	46,048	133,119	44,868	29,404	24,472
Union Pacific System	9,892	11,698,906	1,512,052	14,337,097	1,201,753	3,308,120	424,677	5,233,194	10,926,355	1,894,342	1,267,762	1,624,170
Utah	111	89,593	.....	89,880	9,980	25,935	380	24,853	65,306	11,466	12,468	15,067
Virginian	653	2,319,243	2,363	2,387,867	179,561	399,337	25,990	342,357	981,338	961,529	1,024,907	996,531
Wabash	2,409	3,679,311	232,753	4,189,227	461,155	679,194	151,452	1,573,401	3,024,781	929,568	604,536	315,703
Ann Arbor	294	349,136	1,651	358,066	23,348	65,979	13,445	160,002	274,846	60,640	46,831	24,678
Western Maryland	859	1,768,700	6,755	1,839,638	187,732	386,576	42,247	458,164	1,131,244	548,394	547,096	524,201
Western Pacific	1,195	1,341,764	71,546	1,445,081	134,582	265,756	63,187	584,703	1,113,455	239,526	141,971	16,317
Wheeling & Lake Erie	507	1,375,486	.....	1,425,875	129,019	321,795	36,211	415,127	935,549	240,986	361,949	359,120